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No. 7
VOL. XXVIII

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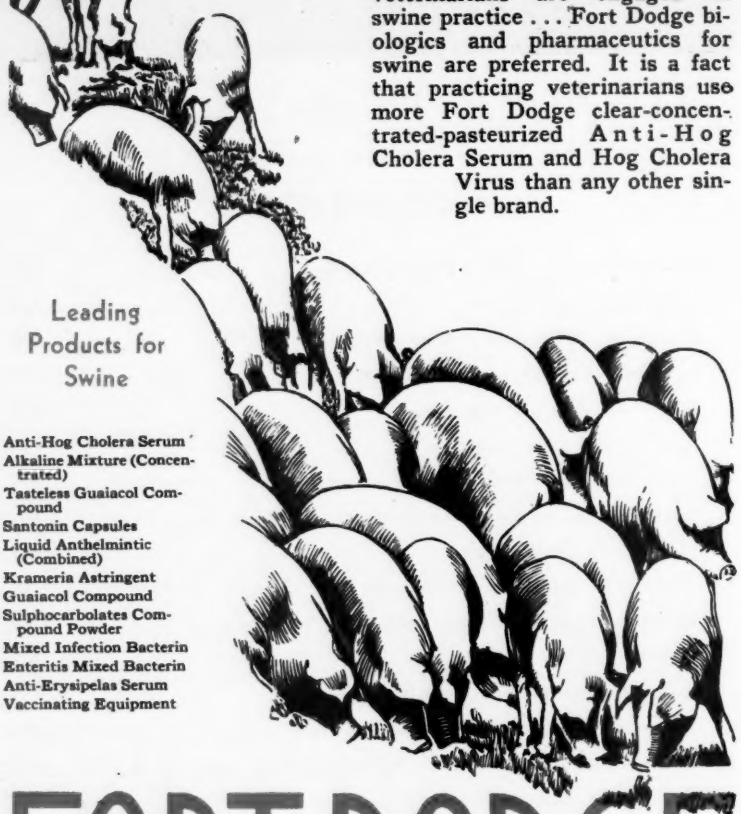

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, 230 Fifth Ave., New York, Eastern Representative

A short time ago, a good milk cow could be sold for the price of a team of ordinary horses or mules. Today, one of those horses or mules can be sold for enough to buy three good milk cows.

The liver possesses a rhythm of its own; increasing uniformly in weight for six hours after the animal eats, by which time the increase in weight amounts to 30 to 35% and then decreasing in weight for the same period of time.

The International Conference on Rabies (1927) recommended that: "Dogs which are known to have been bitten by a rabid animal should be killed without regard to whether they were vaccinated or not. On the other hand, dogs which are only suspected of having been bitten may be vaccinated under condition that they be subjected to a six-months' quarantine."

The production of anti-hog cholera serum and virus in the United States in 1932 required approximately 165,000 80-pound pigs for hyper-immunizing virus; 140,000 250-pound hogs for hyper-immunes; and 45,000 80-pound pigs for simultaneous virus. In other words, approximately one hog of each 1500 in the country was used by the serum industry for the production of serum and virus.

Death due to an inadequate diet may not be due to starvation. When an animal dies from lack of vitamine B, the changes in the carcass are identical with those seen in starvation. This appears to be due to lack of appetite; the animals do not eat enough and actually starve. When, however, an animal dies from lack of magnesium in the diet the postmortem picture is not one of starvation but of faulty use of fat by the body. This is responsible for a considerable loss of stall fed cows in Holland.

Clark, Luten and Cutler of Vanderbilt University have reported a scientific study of the famous "fainting" goats of Tennessee. The goats are so nervously constituted that any excitement makes them perfectly rigid for several minutes. If they try to run they fall and cannot rise till the spasm passes, hence the name "fainting." A similar strain of goat is found in Palestine. The condition is hereditary. Local tradition has it that all fainting goats in Tennessee are descendants of four of the Palestine strain sold in that section about fifty years ago when a traveling show went "broke" there. On the claim that the nervousness is due to a thyroid or parathyroid dysfunction, serum obtained from these "faiting" goats has become the basis of a widely advertised goitre treatment and has made it unnecessary for one veterinarian to continue in veterinary practice.

"There is hardly anything in the world that some man cannot make a little worse, and sell a little cheaper, and the people who consider price only are this man's lawful prey."

Evidence has been obtained indicative that pasty eyes in ducklings is a nutritional disease amenable to the administration of cod liver oil to the breeding ducks.—Mich. S. C. Agr. Exp. Sta. Rpt.

Experience must be the guide in almost all medical endeavors. It is only when theory has been backed by scientific measures and conclusions that it can be said that there is an advancement in medicine. —*Pharmacal Advance.*

Vitamine D, the mineral retention vitamine, is needed by cattle for proper bone building and the absorption of calcium and phosphorus from the digestive tract for milk production in case of milking cows. Recent results show that sun-cured hay furnishes enough vitamine D to prevent rickets in calves fed a rachitic ration and kept out of sunshine. This explains why rickets is seldom observed among calves even in the winter under farm conditions where plenty of sun-cured hay is fed.—Mich. S. C. Agr. Exp. Sta. Rpt.

In the study of the value of orthophenylphenol as a delousing agent for use on poultry flocks, thirty-one flocks were treated by various methods. The most practicable method seems to be to spray the roosts with a kerosene suspension of the orthophenlyphenol. This method, using a Dow Chemical Company preparation stated to contain one part orthophenylphenol to each 19 parts kerosene, apparently gave results equally as good as painting the roosts with nicotine sulphate and should be more economical. More extensive comparative tests would appear desirable as also tests on trap-nested birds to determine if the preparation affects egg production.—Mich. S. C. Agr. Exp. Sta. Rpt.

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The number of diabetic patients throughout the world who are taking insulin is thought to be over a million.—*S. N. L.* 23:29.

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One of the fascinating new chapters in the book of science is the story of the internal secretions. Their potency is almost unbelievable. Their influence is pervasive in all that we do and are. In the present they cooperate in determining the forms of our bodies and the working of our minds. In the past they may have set the pattern of our advancement through the ages.—*S. N. L.*, 23:28.

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The alienation that has commenced, and in some situations ripened, between the veterinarian and the agriculturist, or, at least, the want of confidence in the one and the feeling of unjust abandonment in the other, are circumstances that cannot fail of being injurious to both parties. . . . It is scarcely possible to conceive of two persons who are, or ought to be, more perfectly identified in pursuit and in interest than the agricultural man and the veterinarian. That was an unfortunate day which so widely separated them.—Editorial, *The Veterinarian,* 1843.

During the past ten years there has been an increase in ox warbles over most of northern Illinois. These pests are responsible for driving dairy animals through fences, over embankments, or into pools of water where they stand during the day. These stampedes often result in serious physical injuries in addition to losses in flesh and milk flow.

Dusts containing extracts of nicotine or derris were effective when properly used. Ointments containing iodoform or extracts of derris gave satisfactory results. The homemade ointment giving the best results was made up of five parts vaseline to one part iodoform. The proprietary ointment, Gusanol, gave a somewhat better kill and is less disagreeable to handle. Practical experience with ointments and dusts have shown that the former are the more satisfactory for the treatment of dairy animals. —University of Illinois, Agricultural Experiment Station.

Agriculture, so depressed at the present time, the bankrupt plight of which we read every day in our daily papers, is the backbone of every civilized country, and the wealth of agriculture lies in its animals. The livelihood of the farmer depends on the health of his animals, and the health of the animals depends on the only man who is trained to recognize the deviations from normal, i.e., the qualified veterinarian; for it is only upon a foundation of good health and the control of epizootic diseases amongst animals, that the pastoral industries can be successfully developed.—Prof. F. T. G. Hobday.

Since 1920, Iowa has lost 400,000 horses and mules because of lack of farmer interest. This has released for the production of other livestock and other crops, one and a quarter million acres of land and is largely responsible for the surplus of farm products.—J. W. Boyt.

There has been a great scandal since the fact of the decentralization of our Three Bears has leaked out. The Secretary of the Interior has charge of grizzly bears; the Secretary of Agriculture looks after the black bears (or maybe it's brown!); and the Treasury chief is the Great White Father for polar bears. If a kodiak bear has twins, one black and one brown, there's a happy family disrupted right there.—*McCall's Magazine.*

History shows there has never been durable, generally, distributed prosperity in any heavily taxed country. When the annual tax collections exceed 15c per dollar of national income or one-seventh of all income, the law of diminishing returns is set in operation. First it destroys buying power, that kills demand, stagnation of business and unemployment follow and we have the condition that we term a depression. A condition that must continue until the total sum expended by the governments is 15c per dollar of national income or less. For the first 125 years of American progress, the total taxes levied averaged less than 9c per dollar of national income. Americans are now paying 43c of each dollar earned for the upkeep of our over-jobbed and over-expanded governments. That, more than any other one thing, is the reason for our distress. Similar government extravagance has been worldwide since the war and is the main cause of the world chaos. Times will not improve until the cost of government is lowered.—*L. D. Staplin.*

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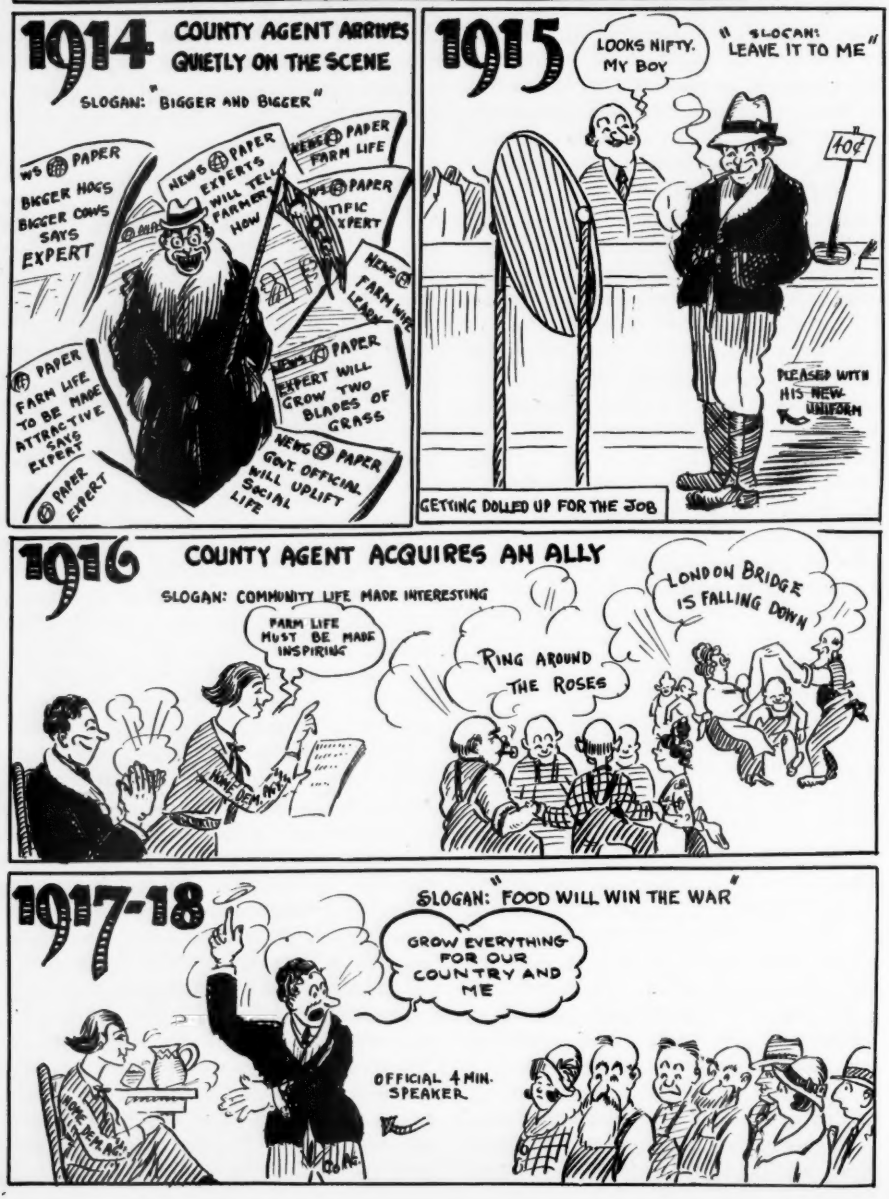
PICTORIAL HISTORY OF AGRICULTURAL EXTENSION


1914
COUNTY AGENT ARRIVES QUIETLY ON THE SCENE
SLOGAN: "BIGGER AND BIGGER"
WS PAPER BIGGER HOGS BIGGER COWS SAYS EXPERT
NEWS PAPER EXPERTS WILL TELL FARMER HOW
NEWS PAPER FARM LIFE
WS PAPER TIFIC XPERT
NEWS FARM WIVE LEADS
NEWS PAPER EXPERT WILL GROW TWO BLADES OF GRASS
PAPER FARM LIFE TO BE MADE ATTRACTIVE SAYS EXPERT
PAPER EXPERT
NEWS PAPER GOVT. OFFICIAL WILL UPLIFT SOCIAL LIFE
1915
LOOKS NIFTY. MY BOY
" SLOGAN: LEAVE IT TO ME"
40¢
PLEASED WITH HIS NEW UNIFORM
GETTING DOLLED UP FOR THE JOB
1916
COUNTY AGENT ACQUIRES AN ALLY
SLOGAN: COMMUNITY LIFE MADE INTERESTING
FARM LIFE MUST BE MADE INSPIRING
RING AROUND THE ROSES
LONDON BRIDGE IS FALLING DOWN
1917-18
SLOGAN: " FOOD WILL WIN THE WAR"
GROW EVERYTHING FOR OUR COUNTRY AND ME
OFFICIAL 4 MIN. SPEAKER

1919-22
SLOGAN: BUY ON CREDIT- PAY OUT OF FUTURE CROPS
THUMB SUCKING IN BABIES IS AN ACQUIRED HABIT, SOMETIMES DIFFICULT TO BREAK UP
ISN'T SHE WONDERFUL!
TRACTOR SALESMEN
TRUCK SALESMAN
SELL YOUR HORSES. BUY TRACTORS. BUY MORE LAND - BUY MORE TRACTORS BUY - BUY - BUY
1923-24
SLOGAN: EVERY MAN HIS OWN VETERINARIAN
REMEDY PEDDLER
MINERAL EXPERT
HOME COW DOCTOR
WITH THE HELP OF THESE GENTLEMEN I AM GOING TO TEACH YOU EXPERT DIAGNOSING OF ALL DISEASES OF ALL ANIMALS ALSO ALL DOMESTIC ILLS
WINDOW SHADES SHUT OUT PART OF THE SUNLIGHT.
MAGGIE - I NEVER THOOCHT OF THAT
COW CARE
MINERAL
BRICK
COAL
FEED
I DON'T HAVE TO RUN THIS ON BUSINESS PRINCIPLES. I FEED AT THE PUBLIC TROUGH AND PAY NO TAXES
1926-29
NO TWO CHILDREN ARE ALIKE. THEY ALL NEED PLAY
SLOGAN: TRADE WITH YOURSELVES (ME)
1930-32
FOR RELIEF TAKE THIS
FARM BOARD COST TO THE TAX PAYER
$35 0,000,000
HIS MAJESTY THE COUNTY AGENT
RELIEVED OF EVERYTHING BUT THIS
CORN 10¢
HAY $5.00
OATS 7¢
FARMER

Achievements of Veterinarians

The veterinarian alone has succeeded in handling livestock-disease-control measures. Every important livestock country in the world maintains veterinary colleges at public expense to train veterinarians in the control of livestock diseases. Without a good veterinary service there can be no profitable livestock industry anywhere.

Animal disease control is more difficult in the United States than in any other country and its failure here would prove far more costly because there is no similar interchange of breeding stock or dairy animals and feeder stock in any other country. The traffic in feeder stock is, practically speaking, peculiar to this country. This large interchange of animals allows contagious diseases innumerable opportunities for spread that they would not otherwise have. Yet the fact remains that our livestock industry, as at present constituted, is totally dependent upon this traffic.

The American veterinary profession has rendered to this country a further service, the value of which cannot be estimated accurately, in barring foreign animal plagues from our shores or in totally eradicating them from our country. For example, the four chief bovine scourges affecting the cattle of the world have been contagious pleuropneumonia, cattle plague, foot-and-mouth disease and tuberculosis.

Contagious pleuropneumonia was eradicated in 1892 by veterinarians at a cost of $1,500,000. This was strictly a veterinarian's job. It required five years to complete. The United States was the first of the large nations of the world to accomplish it and this scourge of cattle continued to exist in western Europe until 1912, and it still takes heavy toll in many countries.

In the eighteenth century cattle plague (rinderpest) destroyed thirty million cattle in Germany. Following the Napoleonic wars, its ravages led to the establishment of the earliest veterinary colleges. Rinderpest still exists in Asia and Africa but has never been allowed to invade our shores, due solely to the quarantine against its importation maintained by the Veterinary Service of the United States Department of Agriculture.

Foot-and-mouth disease is the most contagious disease of animals known. All cloven-hoofed animals and mankind are susceptible. Practically all of the leading livestock countries other than the United States, suffer severely from it. It has been introduced into this country eleven times and each time eradicated by the combined efforts of veterinary practitioners and veterinarians employed by the Government and the states. It has been authoritatively estimated that, were this disease indigenous to this country, it would cause an average annual loss to the cattle industry from various sources of approximately one billion dollars. The efficiency of our veterinary service is responsible for saving this enormous loss to the livestock industry.

Tuberculosis, the only one of the four cattle scourges with which our cattle industry has to contend at present, is already under control. In fourteen years its prevalence in this country has been reduced sixty-five per cent. The percentage of infected animals in most European countries is ten to twenty times as high as it is here. The success attending the stupendous sanitary program necessary to eradicate this disease is a high tribute to the efficient work of the veterinary profession of this country. Twelve years ago this disease cost our livestock industry fifty million dollars a year. Its practical eradication is already in sight.

Twenty-five years ago, tick fever was widespread over fifteen southern states and reduced the livestock possibilities of that area by fifty to seventy-five per cent. It has been wholly eradicated from twelve of the fifteen states and much of the territory of the three other states is now free from ticks. This work was carried out from the beginning under veterinary supervision.

Glanders and dourine, diseases of horses, have been to all practical pur-

poses, entirely suppressed. Hog cholera has been brought under control in sections of the country where the use of anti-hog cholera serum and virus has been confined exclusively to veterinarians. Progress is being made in the control of infectious abortion and mastitis of cattle and serious diseases of sheep and poultry. Rabies can be eradicated by the veterinary profession whenever the general public is no longer content to stand the loss of thousands of farm animals yearly from this disease and the general public is no longer willing to bear the expense, inconvenience and anxiety attendant upon the taking of 50,000 Pasteur treatments annually.

Facts of incalculable value to agriculture and to the general public, patiently worked out by veterinarians engaged in scientific research, are the foundations upon which the foregoing achievements were builded. A veterinarian discovered the organism chiefly responsible for contagious abortion. Another veterinarian discovered a successful treatment for milk fever. But for this discovery the dairy cow could not have been brought to her present high plane of production.

Veterinarians have developed the serum-simultaneous treatment for the prevention of hog cholera that makes the present swine industry possible. Without this development the shipping of feeder pigs for fattening, the exhibition of swine at shows and fairs, the great dispersal sales of pure-bred animals and general traffic in swine would be unsafe and impractical.

American veterinarians discovered the role that the fever tick plays in the transmission of Texas fever of cattle. This discovery not only made possible the eradication of Texas fever but led to the discovery that a whole group of diseases of both man and animals are insect-borne. They thus made possible the control and eradication from large areas of many of these diseases, such as yellow fever, malaria, black typhus or trench fever, and a number of others.

Another veterinarian, in a study of anthelmintics for dogs, developed a treatment for hookworm disease in man. Millions of doses have been given to sufferers from hookworm disease and millions of invalids have been restored to health. The gain to the individuals and to whole communities and even nations is beyond calculation. The contribution of this discovery to human welfare and happiness transcends even its economic importance.

The contributions of the veterinary profession to the betterment of public health are by no means insignificant. Many diseases of man are contracted from lower animals. The veterinary profession is the first line of defense against those diseases and it is serving the public well in this respect.

The veterinarian is the only man trained in the fundamental sciences upon which adequate food inspection is based; particularly foods of animal origin, meat and meat products, milk and milk products, eggs, fish, etc.

Seventy per cent of the animals slaughtered for food in this country, approximately 75,000,000 animals annually, are slaughtered in packing plants in which Federal meat inspection is maintained. The inspectors are veterinarians. We could not export a pound of meat to Europe as we now do, but for this inspection, and it must be done by veterinarians to meet requirements as to wholesomeness.

Veterinarians as milk inspectors, by certifying to the wholesomeness of milk and by eliminating cows having tuberculosis and other diseases from the dairies supplying milk to our cities, have been a tremendous factor in bringing about the extraordinary large consumption of milk by our citizens. This has benefited the users of milk and supplied a greatly enlarged market for the producers of milk. Unfortunately, not all city milk inspectors are veterinarians. But no milk inspection is adequate that cannot certify to the healthfulness of the source, the cow, and only a veterinarian can do that.

The foregoing achievements of the veterinary profession are in addition to the ordinary everyday work of the practicing veterinarian in preventing the common, ordinary diseases of horses, cattle, sheep, swine, poultry and pet animals, and ministering to their everyday ills and injuries.

A Century of Progress in Medicine

FOR THE first time in the history of international expositions, organized medicine, dentistry and pharmacy are presenting to the world, at the Chicago Century of Progress exposition, the great story of the contribution of medicine to the progress of civilization. Without the contributions of public health and of medicine the great cities of today, the magnificent industrial organizations, the accomplishments in transportation, in agriculture and indeed in every phase of human activity would have been impossible. Hence it is especially fortunate that the millions of people who are expected to visit the exposition will be able to see at first hand many of the processes by which medicine has arrived at its present high estate and many exhibits of its remarkable results.

MEDICINE has advanced more in the last fifty years than in all the previous centuries of the life of civilized man. Little is it realized, however, that much of this great advancement of the last fifty years is correlated with inventions and discoveries made in the basic sciences, which also are to be thoroughly explained to the public in this exposition. The structure of a molecule seems to the average man to be of little importance in relationship to the saving of human life. When, however, a chemist moves one of the components of a molecule from one point in its structure to another and thereby develops a drug with specific virtues against a disease that has devastated man for the last four centuries, the interior elements of a molecule become of considerable significance.

The nucleus of the scientific exhibits in the Century of Progress exposition will be a series of exhibits brought from the great Hygienic Museum at Dresden. Particularly interesting is the transparent man, a life-sized model of a human being in which each of the organs may be illuminated so that their position in the body and their relationship to other organs and tissues is apparent. Other exhibits in this section indicate the nature of the construction of the joints, the ways in which the head moves and rotates, the manner in which blood corpuscles circulate throughout the body, the way in which the diaphragm and the large muscles of the chest cooperate in breathing, the mechanism of the human voice and similar demonstrations. Many of these are so arranged that the visitor himself may manipulate the devices and study them in detail at his leisure.

FROM the great Wellcome Research Institute in London comes a series of historical exhibits dealing with the ways in which modern scientific medicine controls tropical diseases, and particularly the infections of man and animals. The life of Pasteur is displayed by a series of illuminated maps and photographs; the work of Robert Koch constitutes another series. Italy proudly exhibits the contributions of the great anatomists of the Middle Ages who were the first to bring medicine out of the darkness under which it had labored for 1,200 years. Austria devotes its exhibits chiefly to the work of Semmelweis, the great investigator who forced the medical world to believe him when he insisted that infection in women during childbirth could be controlled. Holland reveals the structure and function of the nervous system as developed in recent years by its outstanding institute for research on the brain. McGill University of Canada devotes its exhibit largely to the contribution to medical science of the great mod-

ern patron saint of clinical medicine, Sir William Osler.

These exhibits by foreign agencies are to be supplemented by a large series of displays under the auspices of American medical organizations. It is proposed to trace the development in the work of the individual physician from the days of the saddle-bag doctor to the highly technical procedures used by the modern physician. One hundred years ago the physician was dependent primarily on his unaided five senses and on his knowledge of the causes of disease for aid in diagnosis. For treatment he used a few natural agencies and a vast array of drugs of unestablished potency and efficiency. Today every one of the senses of man has been extended by the development of physics, chemistry and bacteriology. There are devices by which practically every tissue of the human body is made visible, and apparatus for looking into the body cavities.

PHARMACY today depends on preparations of established virtue in the treatment of specific diseases. Many of the glands of internal secretion have been studied and specific principles isolated which, when they are administered, control deficiencies. The vitamins are found to be of value for health and growth, and may be administered to the human being in many ways to supplement deficient diets. All these discoveries will be shown from the historical point of view and their application will be demonstrated.

Just as foreign universities will reveal to contribution of many great names of the past, so will American institutions trace the contributions of the founder of modern physiology, William Beaumont, who published his clinical investigations of the stomach of Alexis St. Martin in 1833.

Dentistry will be fully elucidated in a great space full of historical and practical demonstrations. Many of the greatest medical industries of the country will tell the story of the advancement of scientific medicine, including such phases as the relief of pain, the service to the sick, the story of antisepsis and asepsis in surgery, the control of infections, the increasing knowledge of hormones and industrial products, and particularly the development of pharmacy from the medieval herb doctor to the million dollar industries of our modern era.

THE American Medical Association holds its Annual Session in Milwaukee during the week from June 12 to 18. The week following is to be medical week at the Wold's Fair. During that week the American Association for the Advancement of Science and several other medical organizations will meet in Chicago. Among the great scientists from abroad who will read papers in this session are the following: A. V. Hill, University College, London; R. Goldschmidt, Kaiser Wilhelm Institut, Berlin; August Krogh, University of Copenhagen; Joseph Barcroft, Cambridge University, England; Filippo Bottazzi, University of Naples; C. U. A. Kappers, Central Institute for Brain Research, Amsterdam, and Constantin Levaditi, Institut Pasteur, Paris.

A public meeting has been arranged at which papers will be read by Paul Dudley White of Boston on heart disease; Max Cutler, Chicago, on the control of cancer, and Morris Fishbein, Editor of Hygeia, on the frontiers of medicine. It is expected also that Madam Curie will on this occasion say something about the development of radium.

A century of progress in medicine tells some of the greatest stories of human advancement that could possibly be told. It has meant the prolongation of life by more than thirty years for the vast majority of human beings. It has meant the freeing of mankind from the fear of pain, disease and death. To see, to hear and to participate in such a demonstration should be an epoch-marking event in the life of every human being fortunate enough to take part.—Editorial in *Hygeia*, June 1933.

Veterinary Publicity and Other Matters

ELSEWHERE in this issue we have attempted to give a graphic record of Agricultural Extension in this country during the past 17 years. The record is accurate in that it depicts actual occurrences. We hope it is reasonably fair in that the activities depicted have not been the extremely exceptional, rare, or unusual ones. In another place, a very brief and incomplete list of achievements of the veterinary profession is given. This too is accurate and we believe fair.

One of the complaints most frequently heard from veterinarians is that the general public has little knowledge and less appreciation of the importance of the services rendered by veterinarians, and that for this reason, the rewards of veterinary practice and of other lines of veterinary activity are not commensurate with the worth of the services rendered. It is undeniable that the complaint is justified; but the responsibility for the condition complained of may not be, probably is not, the public's.

In another section, a brief description is given of the Medical Exhibit in the Hall of Science at A Century of Progress in Chicago. Never before in history has there been such an opportunity for science to display its achievements to the world. In the vast building devoted to the sciences at the "World's Fair" nearly every branch of science, of wide public appeal, has on display its remarkable achievements during the past century. The display of the science of medicine is not exceptional—it is perhaps even less spectacular than that of some of the other sciences.

The existence of no other science is so well known to the general public as is the existence of the science of medicine, and none other comes in such intimate contact with all of the people all of the time. It is at least a thousand times better known than veterinary science. Yet, the medical profession has deemed it expedient and wise to make a great effort to display its achievements to the millions who will visit the Hall of Science.

The veterinary profession, little known, and almost wholly unappreciated, has not deemed it worth while to show these same millions what it has achieved. We think it has passed up a golden opportunity. The small cost of an exhibit in the Hall of Science that would depict all of the achievements of veterinary science enumerated in the foregoing pages and many more is easily within the reach of the veterinary profession, niggardly as it has always been in expenditures for its own advancement in public appreciation. What the profession lacks is the desire —not the funds.

A further instance of this is illustrated by the reception of the proposition to have a scientific exhibit in connection with the A. V. M. A. meeting next August. The next A. V. M. A. meeting will be held in a hotel better adapted for convention purposes than any at which a previous meeting has been held; among the facilities afforded is a great hall available for commercial exhibits, registration and general rendezvous for the members attending the meeting. This hall contains ample space and facilities for a scientific exhibit in connection with the meeting. Such an exhibit is an important part of every meeting of the American Medical Association and of numerous other scientific associations. It is an innovation at an A. V. M. A. meeting.

The Local Committee on Arrangements for the Chicago meeting proposed having a scientific or educational exhibit as a part of the meeting and offered to defray every expense for space, lighting,

shelves, tables and partitions. The various veterinary colleges and experiment stations and others engaged in veterinary research were invited to take part in this exhibit. With a few conspicuous exceptions, the proposition aroused no enthusiasm and but academic interest. No disapproval of the project was voiced but there were other purposes to which available funds could be put. Of course, this is not an exhibit comparable to one at the "World's Fair" and could have little public influence, but other scientific associations deem it worth while to inform all of their members of their scientific progress, new discoveries and developments. Why should not veterinary educational, research and other scientific institutions deem it worth while to inform the veterinary profession fully as to their achievements and activities? Perhaps it isn't worth while, but it seems that it should be. However, the attitude of veterinarians engaged in specialized branches of veterinary science in this matter is no different from the attitude of the profession in general.

Fortunately a few of the progressive institutions have accepted the offer to participate in the educational exhibit of the A. V. M. A. and this exhibit, although small, will be of high class and we believe will be appreciated highly.

Associated Serum Producers, Inc.

The veterinary profession has received considerable desirable advertising both over the radio and in farm papers from serum producers—notably from the Allied Laboratories. A recent move on the part of the majority of serum producers that confine distribution of their products in whole or in the major part to veterinarians, will increase largely the amount of such advertising the present season.

The new organization is known as "Associated Serum Producers, Inc. Its purpose is "To protect the serum industry and safeguard hog raising through the proper administration of serum and virus."

Their advertising project provides for large display space in *Successful Farming*, and in nine state farm papers—*Wallace's Farmer, Nebraska Farmer, Farm Stock and Home, Prairie Farmer, Missouri Ruralist, Farmers' Guide, Kansas Farmer, Ohio Farmer* and *Dakota Farmer*. The copy used in their advertisements warns farmers against the hazards of vaccination by unskilled hands and proclaims that only the experienced veterinarian can know both when and how to vaccinate. All advertisements end with the slogan in bold letters "Consult Your Local Veterinarian."

The schedule of farm papers insures that these messages in behalf of veterinarians will reach a total of more than two and one-half million farmers periodically throughout the vaccinating season, and should do much to offset the vicious advertising now being done by a few who market their product direct to the farmer and advise the use of minimum doses of serum on all occasions if not in the hope, at least with the certainty that if their advice is followed, the farmers will need a great deal more serum and thus, their potential market will be proportionately increased. No sane veterinarian who values his own future, or is concerned with the welfare of his clients, will use serum and virus produced by this latter group.

Successful Farming, the "back bone" of this advertising campaign, is distinctly friendly to the veterinarian and takes the broad view that the best veterinary service is none too good for the farmer. The advertising of the Associated Serum Producers, Inc., thus having in this publication the support of the editorial policy of the paper, should be productive of much good. Unfortunately several of the other papers selected are editorially distinctly unfriendly to the veterinarian, and advertising in them must labor under the handicap of editorial disapproval.

These Associated Serum Producers, have placed veterinarians in their debt, since the advertising for which they are paying by its very nature will benefit veterinarians more than themselves.

Proper Feeding of Dogs

By ROY H. SPAULDING
White Plains, New York

Dogs are by nature carnivorous animals. After maturity and in vigorous health they posess a considerable adaptability to a diet of cereals and a very limited capacity to digest leafy and other vegetables. During growth and senility however, and during illness, they require a diet exclusively or almost exclusively of animal origin—meat and meat products, eggs, milk and milk products. Dogs do best on a concentrated diet, but if accustomed to a bulky diet, the change if made, should be gradual. The common practice of modifying cow's milk for puppies as it is modified for human babies is wrong in theory and disastrous in practice.

I WRITE upon this subject with a certain degree of hesitation, knowing as I do that my theories on the subject differ considerably from those of the majority of leading small practitioners, and they differ radically from the recent teachings of certain investigators. I believe, however, that my ideas are sound since they are justified by practical application. As Doctor Quitman said recently, scientific research is admirable and brings to light many truths and no one of experience would deny the value of the laboratory in solving our problems. However, it is too often the case that research work is carried on in a manner and on subjects and in environment so different from conditions met in practice that the findings have to be modified to apply in general practice.

To illustrate my point I shall digress to mention certain zoological facts which, while well known, seem to be entirely ignored by many. There are three great classes of animals, herbivora, omnivora and carnivora. The horse, cow, sheep and goat are members of the first, to the second belong the hog and man, and of the third the wolf, fox, lion and tiger are undisputed examples. That the cat and dog belong to the latter rather than to the class of omnivora is a fact of which most laymen and many veterinarians have apparently lost sight. It seems to be generally accepted that because the dog lives in the house and associates so closely with the family, he should be fed in the same manner. Domestication of the dog has changed only his attitude toward man. It has but dulled his instinct of self preservation. He still retains the animal instincts of fighting, burrowing, hunting, killing and of seeking a mate. It takes but one generation for him to revert to the wild. Man has succeeded in strikingly altering his conformation but has not changed his basic anatomic structure. And while he has desperately tried to make a vegetarian of the dog, the digestive tract still remains that of a carnivorous animal.

The Dog Requires Concentrated Foods

All herbivora require a bulky food, which must be a vegetable origin. Roughage and bulk are necessary to the digestive processes. Such animals can live and thrive on a diet which is made up entirely of roughage but they cannot get along on a diet of concentrates exclusively. Horses are not able to digest animal food as may be seen by the fact that when mares eat the afterbirth at the time of parturition it is passed in the feces in the same condition as when it enters the stomach, untouched by digestive juices. On the other hand the afterbirth which is eaten by the carnivora when it is passed, is almost if not wholly digested. Hogs and man of the class of omnivora may subsist and thrive either on a concentrated or a bulky diet,

of either animal or vegetable origin. Cannibals are said to live on an exclusively animal diet and there are a great mass of people living entirely on vegetable food. I have raised pigs from weaning to maturity on absolutely nothing but the offal from a country slaughter house, and then fattened them on corn. Our wild carnivora live almost exclusively on animal food.

A comparative study of the relative sizes of the digestive tract of the three classes varies with the type of food they are intended to consume. Taking the horse as an example of herbivora we find, according to Sisson, that the intestinal tract is one hundred feet in length and of this seventy feet is small intestines with an average diameter of three inches and twenty-five feet is large intestines the diameter of a greater part of which is eight to ten inches. In the hog the small intestine is about sixty feet long and the large about fifteen feet. In the average dog the small intestine is about twelve feet long while the large is only fifteen to eighteen inches and its diameter is but little greater than that of the small intestine. From these figures we find that in the horse one quarter of the intestinal tract is large intestines, in the hog one-fifth and in the dog one-eighth. Furthermore the greater diameter of the large intestine of the horse makes the content much greater in proportion to that of the small intestine than is the case in the dog. Perhaps the proportion is fifty times greater. From these facts it will be seen readily that a long voluminous large intestine is necessary for the digestion and assimilation of bulky foods that require elaborate changes in the process of digestion. Where this capacious digestive organ is absent the food must necessarily be concentrated and the digestive process required relatively simple.

The dog must be fed a concentrated food because the digestive apparatus with which he is supplied can digest bulky foods only with the greatest difficulty if at all. In spite of the fact that the foregoing facts concerning the digestive apparatus of the horse, hog and dog are known to all veterinarians, there is a great tendency for them to direct the feeding of dogs in the same manner and on the same foods as are fed the human. The figures show that the digestive tract of omnivorous man approaches more nearly to that of the horse than it does to that of the dog. That is, the difference between man and dog is greater than that between man and horse. Consequently man's diet should be more like that of the horse than that of the dog.

Vegetables—Cereals—Meat

There are in general three classes of foods from which to make our choice, that is vegetables, cereals and meat. In my experience at least 75% of our dogs have difficulty in digesting vegetables and I dare say 25% of them are unable to digest vegetables at all. I will admit that there are some individual animals that have lived almost exclusively on a diet of vegetables for years and have thrived. The hardy terriers, particularly the Sealyham, Airedale and Irish, possess such a high degree of vitality that they are easy to raise and much less care need be taken with their diet than is necessary with most other breeds. It is a well known fact that the average farm dog is fed on little else but left-overs from the family table, vegetables, bread and milk —which is usually skimmed—and they are seldom affected with digestive disturbances. But these dogs are able, through their own efforts, to procure an adequate supply of meat. It must also be remembered that these dogs are the offspring of a long line of hardy forebears in which the principle of the survival of the fittest has controlled their destiny. None but the strong and vigorous specimens ever live to the breeding age. On the contrary, in the commercial breeding of dogs every weakling is saved if careful nursing and veterinary skill can save it. The methods of breeding are directed wholly toward production of animals

which conform to a man-made standard of conformation and coat rather than towards the development of healthy vigorous individuals. Such scientific experiments as have been carried out, it is reasonable to suppose, have been on mongrels, strays and dogs of inferior breeding more often than upon those products of intensive breeding which we Veterinarians are called upon to care for.

Vegetables Are Not Digested and Cause Intestinal Irritation

It has been my experience that in the majority of dogs suffering from acute indigestion the cause is found to be vegetables and of these string beans, carrots, potatoes and celery are the most common offenders. I have repeatedly demonstrated to my clients vegetables that have gone through the digestive tract absolutely unchanged by the digestive juices. One instance of this occurred in a kennel of sixty dogs where it was a practice to mix two pans of ground boiled carrots in the daily ration. One spring after a hard winter in which we had had a great deal of snow I visited the kennel following a series of warm rains. The runs had filled with snow which had packed down and frozen. It had been impossible to keep the yards clean and the feces had frozen in the snow. The rain washed away the surface snow and the digested portion of the stool leaving a dirty ring in which many pieces of carrot of the same size, shape and consistency of that which was originally given to the dogs. This aroused my interest and I made a thorough search through all the runs for evidence of a stool in which there were no carrots but was unable to find one. Needless to say the man stopped feeding carrots. Often a client will argue that she always purees the vegetables, but I maintain that the mashing increases the digestibility but little. It is the general impression among the laity that vegetables are necessary for growing puppies. To my mind this is the time when they should under no condition be used. They will do a great deal of harm to the puppy and can be of very little if any benefit. The digestive system of the puppy is delicate and by nature endowed with the power to digest only food of animal origin. When unnatural food is introduced into the digestive tract a heroic effort is made to adjust itself to such foreign conditions.

Adjustment to Unnatural Foods Difficult

If the puppy has sufficient stamina and is not handicapped by the presence of parasites, by undue handling, improper bathing, radical temperature changes, changes of environment or by various other conditions to which a puppy is commonly subjected, which tend to lower his natural vitality, he may be able to adjust himself to this unnatural food before the digestive tract becomes inflamed and its efficiency seriously impaired. Even when the puppy is capable of digesting the vegetable food the amount of nutrition assimilated from it is meager and the puppy fails to thrive. The minerals and vitamins which the puppy may obtain from vegetables can be supplied more economically and efficiently from other sources. There are times and conditions when vegetables serve a purpose in the diet of the dog, but they should be considered as a filler and a substitute rather than as a food.

Meat Conduces to Vigor Not Viciousness

Dogs fed a diet containing a high percentage of meat will, sooner or later, depending on their natural ruggedness, get in superfine condition which may be exhibited by great vigor or by temper—hence the old adage that meat will make a dog vicious. It doesn't make him vicious, just makes him natural. A well fed dog may get too heavy, or eczema may develop. Under such conditions the ration of meat must be reduced and, to maintain the bulk in the ration to which the dog has been accustomed, vegetables may be added. Dogs in such condition can without great hardship adjust themselves to this foreign food and will, if the change is made gradually, take care of it

with little or no difficulty. Animals of the bull dog type, particularly the Boston Terrier, should never be fed vegetables except in very sparing amounts, because they are universally noted for weak digestion. When vegetables are to be fed great care should be exercised in impressing upon the owner the importance of selecting carefully only those vegetables which cause the least harm. In general no vegetable which grows below ground except the onion should be used; and onions, when fed to excess, cause an anemia. Potatoes, carrots, beets, turnips etc., contain a high percentage of starch and are hard to digest even for man. Beans, peas, corn and the like come next. Onions, tomatoes and the leafy vegetables such as spinach, beet tops, cauliflower leaves, cabbage, are in my experience the least difficult of vegetables for the dog to digest and eliminate.

Cereals a Valuable Food

Cereals, when prepared and fed in the proper manner, are an excellent adjunct to meat, and supply the necessary amount of roughage in the diet. Because an unnecessary amount of bulk, as I have pointed out, inhibits digestion, cereals should not be given in a sloppy state but should be cooked and then dehydrated into a hard dry cake. This should be fed preferably in large chunks so the dog will have to chew them. When given in this manner the cereal approximates in consistency one of the natural foods of the dog, that is bone. Obviously the commercial dog biscuit fits this description and in most cases is the best possible manner in which cereal can be used. Of course not all brands of crackers are of equal value and one must learn by experience which are best fitted to one's need. In general those which are coarse grained and hard baked are the best. By formula those which contain the greatest percentage of wheat flour are usually the most satisfactory.

Don't Feed Mushy Food

Soaking the crackers before feeding defeats the purpose of that biscuits fed dry best serves. I am not at all sure that the manufacturers themselves appreciate this since I have seen, in bench shows where they had the feeding privilege, they often soak their crackers to a mush before feeeding them. Rice and corn meal have been used a great deal in the feeding of dogs but are far from satisfactory largely because they are fed as a mush. I have in mind one kennel, the experience of which is to my mind a convincing proof of the superiority of the dry dog crackers over mushy cereals. This was a second rate boarding kennel run by an elderly man who in years gone by had been one of the leading handlers of the country. He fed a mush of corn meal one day and of rice meal the next, spending much valuable time in preparing these pet concoctions to the neglect of the other work about the place. For years I labored with him to change his method of feeding and during that time we had countless cases of bad digestive disturbances, many of which were fatal. I dare say we would average a dozen cases of black tongue a year. Finally six years ago I succeeded in getting him to use biscuit of a good reliable manufacture. From that day to this he has never had a digestive disturbance of sufficient consequence to require the services of a veterinarian.

Whole wheat bread may be rebaked in the home to good advantage and when given dry is good. White bread on the other hand sours and produces a very offensive and copious stool. Of the dry cereals shredded wheat is the only one I find satisfactory for use and in many dogs this passes through the digestive tract unchanged.

Meat Should Be the Basis—Other Foods the Adjuvants

Meat should unquestionably be the basis of every dog's ration from the time he is weaned to the day he dies. It should comprise a large proportion of the diet during puppyhood and until the dog has reached maturity. Through his

prime and until he shows signs of being on the decline the quantity of meat may be cut to a minimum. Again, as old age comes on, and with it the deficiencies in the function of the internal organs, the proportion of meat in the diet should be increased. The greatest objection to an exclusive diet of meat throughout the life of the dog is the fact that the quantity necessary to rear the dog and maintain him in proper condition would seem insufficient to the average owner, and the state of flesh into which he would feed him would not be pleasing to the eye. Cats are kept on the exclusive meat diet in the majority of homes; but as a rule they are such fastidious eaters that they do not consume more than is required. But the same cannot be said of the dog. Cats are also much more particular as to the cleanliness and freshness of their food and do not become scavengers as readily as do dogs.

Raw Beef the Meat of Choice

In making a choice of the proper meat to be fed economical reasons may influence the selection. Raw beef is, I believe, the best form in which meat may be used under ordinary conditions. While I can furnish no scientific proof of it, I'm conducting a veterinary practice, not running a research institution, it seems to me that raw beef is more easily digested than cooked. Certainly in the natural state dogs eat their meat raw and it is only reasonable to assume that their digestion is more suited to raw than to cooked meat. Raw meat contains more of nutritive value per pound than does cooked meat, and it more easily prepared. On the other hand it is not always possible to keep fresh raw beef available at all times. Often it is more economical to purchase cuts of meat which contain a great deal of bone and gristle, and it is necessary to cook such meat to prepare it easily for consumption. Where only one dog is kept in the home, meat from the round, chuck or neck is more serviceable. In kennels where large quantities of meat are consumed the bottom round is usually the most economical meat that can be bought from the average butcher shop. This meat is entirely free from bones, comparatively free from gristle and may be prepared with the greatest ease and the least waste. The heart is an excellent source of supply but it is generally conceeded that it must be boiled in order to be satisfactorily used. Under certain conditions cheaper meats such as cow meat, check pieces and tongue trimmings may be available. This makes very satisfactory meat; can be given raw, and can be purchased economically. In the home with only one dog it is often more practical to feed meat left from the table, which is satisfactory for his use. These include roast beef, steak ends, stew beef, roast or stewed lamb and veal. In some sections lamb and veal may be procurable at a price to make them suitable kennel food.

The Use of Horse Meat

At one time horse meat was used extensively in kennels in this section of the country but the condition of the dogs became so deplorable that it was necessary to eliminate this source of food. I don't know why. It isn't my business to find out. As I said before I'm not running an experiment station and I decline to experiment with the patients my clients bring me. There has been considerable controversy as to the suitability of horse meat for dog consumption. Experiments by undoubtedly able men have been carried out which tend to prove its digestibility and nutritive value and I am not decrying their work. I hope to see more research into the nutrition of the dog. But my experience, which was at one time quite extensive, is just as I have given it. It may have been the tissues used or the way it was processed or some other factor not inherent in horse meat alone but the fact remains that sooner or later dogs fed upon it became affected with recurrent bowel trouble. It seems to me that any food which will irritate the bowels so as to

cause diarrhea from one feeding will if fed continually constitite a source of irritation which will eventually produce a distinct inflammation. Another source of trouble which followed the feeding of horse meat was unthriftiness of the coat and eventually eczema. I will admit that the trouble might possibly have come from feeding too great a quantity of the horse meat or with the combination with which it was used. In most of the kennels where we had trouble and switched back to beef, our troubles were eliminated even though the same kennel men or owners were feeding the animals and for the most part regulating the quantity.

Fowl, Fish, Liver

Occasionally in the home, dogs may be fed chicken and other fowl, fish and liver. Of these fowl would rarely be thought of as an economical food for a large number of dogs, and how a continuous feeding of fowl would effect dogs I am not prepared to say. Occasionally one encounters a pampered pet who refuses any other type of food but by the time the veterinarian sees him drastic action must be taken, not necessarily because of the type of food, but because the dog has received too much. I have not had experience in the intensive feeding of fish to dogs but because of the trouble experienced in the fish districts I have been hesitant about using fish extensively. Liver has somewhat the same effect on dogs as does horse meat and a continued feeding of it will produce a fatty degeneration of the liver of the dog.

Canned Dog Foods

The extensive feeding of canned rations which has taken the country by storm in the past few years has resulted in increased work for veterinarians. Intestinal deficiencies following the extensive use of these canned foods has become so prevalent that it is possible on examination to foretell the type of food which has been used. There are countless preparations of this type on the market today some of which have real virtue and some are probably of doubtful value, some very doubtful perhaps. Such experience as I have had with these foods leads me to believe that the most of the trouble which follows their use come from using too great a quantity. There are a few brands which contain meat exclusively or with a small percentage of cereal which I believe to be best adapted for use.

Milk a Too Bulky Food For a Dog

Cow's milk varies so greatly in composition from that of the bitch that its extensive use in feeding of dogs is the source of more trouble than satisfaction.

A study of the composition of the milk from the three classes of animals shows clearly the type of food which is required by each. Unfortunately the available analyses even of cow's milk vary somewhat and it is necessary to depend on an average struck between those from the most reliable sources.

	Herbivora Cow's Milk	Omnivora Human	Carnivora Dog
Water	87.4	88.2	71.1
Solids	12.6	11.8	28.9
Proteins	3.6	1.5	13.
Sugar	5.	6.6	3.5
Fat	4.	3.4	12.4

From these tables it may be seen that the milk of the carnivora is far more concentrated than the other two classes, there being more than twice the amount of solids found in the other milk. The amount of protein is four times that of the cow while the sugar content is little over half. There is more than three times the amount of fat in the bitches' milk than in that of the cow, and in this analysis the cow is given credit for more fat than is usually found in commercial milk. In feeding puppies on cow's milk it has been the custom to skim or dilute it with an equal quantity of water and to add milk sugar as is the custom in modifying milk for babies. This procedure is in every way contrary to what should be done. Instead of skimming the milk to remove the fat a large percentage of fat should be added. Protein should be

added and the quantity of sugar reduced. This may be accomplished in either of two ways. If a raw egg is added to a cup of milk the resulting mixture will approximate in composition that of bitches' milk. If it is desired the same thing may be accomplished by adding cream and casein. In order for a dog to obtain anything like a sufficient degree of nourishment from straight cow's milk it is necessary for him to consume large quantities of it, and this will cause a dilation of the stomach. If continued, this practice, seriously impairs digestion. I believe a media of milk in the digestive tract of the dog to be a most fertile field for the propagation of worms. It has been my observation that those puppies which are weaned and fed on a diet containing large quantities of milk develop worms, to such an extent that they must be treated, earlier and more frequently than dogs which are fed a dry concentrated food. When I am able to control the feeding of puppies, the administration of worm medicine is rarely ever necessary, and is usually carried out if at all only as a matter of routine when the puppy is three or four months old. Sour milk, buttermilk and potcheese may be used to some advantage in feeding middle aged and old dogs mainly to correct constipation.

Eggs a Substitute for Milk

The composition of eggs is very similar to that of bitches milk, the greatest difference being in the absence of sugar, and for this reason may be used as has been stated in the diet of young puppies. Eggs also are an excellent adjunct to the diet, throughout the growing period; since they may be mixed with the ration thereby greatly enhancing the amount of nutriment without adding much to its bulk. The fat in the egg adds that ingredient to the diet in a form which may be digested most easily. Eggs are reputed by kennel men and rightly so to be excellent for the promotion of the growth of hair. This virtue is not due to the nutriment alone but also to the large amount of sulphur contained in the yolk. It is unwise to use eggs in the diet of the mature dog, in good condition since it will lead to plethora.

Bones Valuable in the Diet

Bones are of great value in the dog's ration; but unfortunately, for various reasons, there use has to be limited. They are one of the two natural foods of the dog and account for the very strong acidity in the dog's gastric secretion. The fact that bones may be eaten in chunks, and digested, is only one more proof that dogs should be fed on a dry concentrated food. Through eating bones the muscles of mastication are exercised, the teeth are kept clean and sharp and the flow of hydrochloric acid is stimulated. If given at all, bones should be used almost constantly in the diet so that the animal will not eat them too greedily, in which case he is very apt to eat too much of them, and eat them too fast and swallow pieces that are too large. Large knuckle and shin bones are best. Steak and chop bones, especially pork chop bones and the bones from fowl should not be given, under ordinary circumstances. I know one veterinarian who raises dogs, on an almost exclusive diet of the carcasses of fowl, obtained from hotels and he claims that he has never had any trouble with the bones; attributing this to the fact that the dogs are so used to them that they eat them slowly and grind them well. The chief reason for limiting the amount of bones given house dogs is: the bones increase the natural tendency toward constipation to which house dogs are prone because of lack of exercise.

Feeding Orphan Puppies

Our first problem of feeding, in the life of the dog, occurs in the infant puppy which has been left an orphan. When this happens at birth, the success of the venture is very doubtful and depends on the presence of a nurse who is sufficiently interested to devote the necessary time and patience. A raw egg and a cup of

milk constitute a good simple formula for the little orphan. A more complicated formula consists of 2½ teaspoonfuls of cream; 2½ teaspoonfuls of casein and four ounces of milk. There are on the market special preparations which when properly diluted make an excellent substitute for bitches' milk and because of their greater convenience these may be the most satisfactory food. The puppies must be fed small quantities and often. One-fourth teaspoonful for small puppies like Pekingese up a teaspoonful for Shepherds. The feedings should be given every two hours during the day and at three-hour intervals during the night. The quantity should be increased slowly, as the need for more food is indicated. When the puppies are two weeks old if they are thriving the frequency of feedings may be reduced to three-hour periods in the day and four hours at night with an appropriate increase in quantity.

Feeding at Weaning Time

In weaning a normal litter of puppies it is advisable to get them on a dry food as soon as possible. This is the method now followed by physicians in the handling of babies as against the old fashioned procedure of giving nothing but milk until the baby was a year old. The feeding of meat should begin as early as three weeks of age and not later than four weeks so that the process of change from milk to a solid diet may be gradual and the puppies entirely weaned from the bitch by the time they are six weeks old. When for any reason it is necessary to remove puppies from the bitch after they have reached the age of two weeks it is possible to begin weaning at that time. Raw scraped beef is given in small quantities, ordinarily half a teaspoonful once a day for two or three days, until the puppies have acquired a taste for it and shown an ability to take it. The meat should be given after the bitch has been away from the puppies for at least an hour otherwise they will be full of milk and not hungry. When the puppies are taking the meat well, it may be given twice a day and increased at two or three-day intervals to three and four feedings a day at which time the bitch will be spending but little time with the puppies during the day. She should be left with them at night particularly in the winter time until weaning is entirely accomplished. When the puppies are taking four feedings a day an equal quantity of dry cereal should gradually be added to the ration. Powdered dehydrated whole wheat bread, shredded wheat or a commercial puppy meal is used. This is mixed with the meat and sufficient water worked into the mixture to make the meal stick to the meat. The quantity of food is increased from time to time as needed and chopped meat may be substituted for the scraped meat. A drink of one of the milk substitutes may be given twice a day and in the larger dogs this may be continued until they are five or six months old. When a large litter is being raised so that its use is practical the meat and meal may be mixed with an egg. It is essential at all times that the puppies should finish their meal still hungry and when this is not in evidence the quantity of food should be reduced. The presence of diarrhea is often an indication that the quantity of food has been too large and one or more meals should be skipped. It is wise to add cod liver oil to the ration of all puppies, whether or not rickets is in evidence or anticipated. It is sometimes advisable to include mineral salts, charcoal, wood ashes or mineral yeast in the ration where the need for these preparations is seen. At two-and-a-half months of age the puppies should be given raw bones of suitable size to worry and chew, or whole puppy crackers may be used. At this age the meal should be changed to a coarser product such as broken whole wheat bread or finely broken dog crackers. At three or four months the frequency of the feeding may be reduced to three times daily; at six months to two a day providing the puppy is thriv-

ing sufficiently well. The meat may then be given in small chunks instead of ground and a certain amount of cooked meat or meat from the table may be used. When the dog has reached his full development the feedings may be reduced to one a day if desired. When the proper care has been exercised in regulating the amount of food to the requirements of the dog there will be no need of making any further change.

The Diet in Illness

In feeding sick dogs a good general rule to follow is at the onset to withhold all food for twenty-four to forty-eight hours and then begin with minute quantities of raw meat increasing the amount as the need is manifested. In cases of gastritis, with the subsequent vomiting, both food and water should be withheld and buttermilk used as a food and as a drink. If the dog will not eat, the buttermilk may be forced or orange juice, tomato juice or weak bouillon may be used. No heavy soups, meat juices or eggs should be given in such cases. In enteritis a mixture of whole wheat bread, egg white and olive oil makes a very efficient food. The yolk of the egg is harder to digest than the white because of the fat it contains and is better withheld when the stomach or intestines are involved. In toxemias and nephritis and any condition where the elimination is impaired it is well to use an exclusive diet of buttermilk for several days. In distemper or other severe prolonged illnesses it is unwise to push the food with the idea of maintaining the animal's strength. It is far better to give only that amount of food, which the dog desires. There are of course exceptions to this since in many cases the dog will not of his own volition eat for days at a time. In such cases egg white and milk are probably the most serviceable food and should be accompanied by remedies that promote digestion and appetite.

With any system of feeding as with any procedure of medication there will always be cases which will not properly respond to a routine and it is necessary for the veterinarian to employ all his initiative and sagacity and develop a course of action which may best seem indicated in the individual case, even though such action may be in direct opposition to accepted methods.

ACUTE SWINE ERYSIPELAS

I am having some trouble in swine in this community. The malady is now occurring on a farm where the swine have all been immunized against cholera and are properly fed and cared for.

The usual symptoms are as follows. The affected swine become gaunt and refuse to eat. Temperature in the early stages varies from 105°F to 108°F. In some cases there is vomition. Nearly all affected swine when forced to move appear to be stiff and sore and stand on their toes, thus showing a humped appearance. High temperature persists for from 24 to 48 hours. Fifteen to 30% of affected individuals die. The deaths usually occur within one or two days after the onset of the disease. Those that do not die shrink markedly and recovery is slow.

The only lesion found is a slight gastritis and an occasional case shows a little enteritis.

I am sending some specimens of diseased tissue and will appreciate a diagnosis.—M. A. L., Nebr.

Reply: You have given a rather complete detailed description of acute swine erysipelas. The specimens have been subjected to various laboratory tests and there was isolated and identified the *Erysipelothrix rhusiopathiae* the specific cause of swine erysipelas and from this finding coupled with the history, symptoms and lesions the diagnosis of swine erysipelas is self evident.

Swine erysipelas serum is usually considered quite effective, however, the serum gives only a temporary immunity and retreatment may be necessary. The infection of swine erysipelas appears to persist on a farm and it is possible that erysipelas will re-occur on any or all of the farms where the disease has occurred.

Nasal Granuloma in Cattle

"Snoring Disease" characterized by the development of tumors in the nasal cavities and in the facial sinuses of cattle, has long been prevalent in India, but has not been reported elsewhere. The authors describe the same or a very similar disease which they observed in Louisiana. Prof. P. G. Malkani, research officer in the Orissa Veterinary College, Patna, India, has just published the result of an investigation from which he concludes the condition is a schistosomiasis due either to the Schistoma spindalis, or a closely related species of fluke.

By G. T. CREECH,
Bureau of Animal Industry, and
F. W. MILLER,
Bureau of Dairy Industry,
United States Department of Agriculture
Washington, D. C.

A DISEASE designated as nasal granuloma, more commonly referred to as "snoring disease," has been known to exist among the work oxen and dairy cows of India for a long period of time.

Literature fails to record the presence of this disease outside of India, and it seems quite probable that until recently a similar malady had not been observed in any other country.

The object of this paper is primarily to report the presence of a disease in this country which the writers believe to be quite similar to, if not identical with, the nasal affection of cattle which has been reported from time to time in India, and also to record briefly the results of such studies made of the disease as time and opportunity have permitted since the malady was first called to our attention.

The disease to be described was discovered in a dairy herd of the Bureau of Dairy Industry, which is located at the Iberia Livestock Experiment Station, Jeanerette, La.

Before giving the results of our observations and studies of the disease encountered, and which is still present in this particular herd, brief reference will be made to the findings of different investigators who have made a study of nasal granuloma in India.

The first extensive studies of nasal granuloma of cattle in India, with particular reference to the etiology of the disease, were made by Krishnamurti.[9] He demonstrated certain "granules," or "club" formations in the nodular lesions which he thought to be characteristic of the "ray fungus," and consequently believed the disease to be a form of actinomycosis. He was not successful, however, in transmitting the disease from animal to animal experimentally.

Krishnamurti[10] has also reported another nasal affection of cattle of India, due to *Rhinosporidium,* which he found to be a disease entirely distinct from the more prevalent form of nasal granuloma.

Cooper [3, 5, 4] has reported from time to time the results of his studies made of nasal granuloma in which he confirmed the histological findings of Krishnamurti, with regard to the rosette-like bodies found in sections from the nodular lesions. He also recovered a streptothrix at various times from the lesions, but was unable to reproduce the disease through repeated inoculations with this organism. He likewise was unable to transmit the disease to healthy cattle, either by inoculations with the nodular material or by exposure of the healthy animals to those showing evidence of the disease.

Das[5] held the opinion that the disease was probably caused by an organism akin to the "ray fungus," but was unable to transmit the disease through different methods of inoculation. He also reached the conclusion that the disease was not transmitted under ordinary circumstances,

We desire to express our appreciation to Mr. S. L. Cathcart of the Iberia Livestock Experiment Station, Jeanerette, La., for valuable assistance rendered in connection with these studies.

through such agencies as food, water, soil, etc.

Oxpring[8] also reports failures in his various attempts to reproduce the disease, and because he found the iodine treatment ineffective in cases of nasal granuloma, he questioned the "ray fungus" as being the causative agent.

He made the interesting observation that no cases of the disease occurred among the buffalo which constituted 50% of the animals in the affected herd. Other investigators have also reported that the disease has not been observed in the buffalo of India.

Malkani[7] has reported the finding of sections of parasites in the nodular nasal lesions; also spindle-shaped eggs and ciliated embryos in the nasal discharges of affected cattle. As a result of these findings, he concludes that nasal granuloma is a form of schistosomiasis, probably due to *Schistosoma spindalis.*

In another recent and interesting paper by Datta[6], evidence is produced to show that nasal granuloma of cattle is of parasitic origin, a form of schistosomiasis. His findings, together with those of Malkani, are of particular interest in view of the lack of definite, or proven evidence heretofore as to the cause of the condition. These findings also offer a plausible explanation of the uniformly negative results obtained by all investigators in their efforts to reproduce the disease experimentally by any method whatsoever.

In regard to the "follicles" and "granules" which Krishnamurti thought to be actinomycotic in nature, Datta offers the explanation that these are peculiar cellular formations due to the tissue reaction resulting from the presence of the parasites in the lesion. He also calls attention to the fact that a comparative histological study showed striking differences between the lesions of nasal granuloma and those of either rhinosporidiosis or actinomycosis.

While there is rather wide difference of opinion as to the causative agent, the different investigators are in agreement as to symptoms and characteristic lesions of the disease; also in their inability to transmit the disease, and the difficulties experienced in overcoming the malady.

History of the Disease in the Dairy Herd

The first animal in the dairy herd at the Iberia Livestock Experiment Station to show evidence of the disease was a registered Jersey cow (Fig. 1). This animal was known to have shown definite symptoms of the disease during the year 1928, and according to statements of herd attendants had shown some evidence of difficult breathing for some time prior to the date indicated. Thus the history as to the exact time that this cow first became affected is rather indefinite. In the following year the disease was observed in other animals in the herd, and by October, 1929, six Jersey heifers were affected. In 1930 three additional animals were showing symptoms of the disease, and by the fall of 1932 three yearling heifers were affected, making a total of 13 cattle showing definite lesions of the disease, out of a total of about 60 animals in the herd.

It is of interest in this connection to note that not all of the animals developed visible evidence of the disease while under exposure to stable environment, as a number of the heifers showed first symptoms after having been out on pasture for a number of months.

Symptoms

The first symptoms usually noticed are sneezing and nasal discharge of a mucopurulent material. The latter is frequently mixed with blood in the more acute cases, and may also contain small portions of the necrotic mucous membrane. The bloody discharges may be seen on the stable floor, or on the grass or ground where the affected animals have been pasturing.

As the disease progresses, difficult breathing is noticed and there is a peculiar droning sound, or snoring, which can be heard for some distance, hence the name "snoring disease."

It was also observed that the affected cattle show a characteristic wrinkling of the skin surrounding the wing of the nos-

tril, due to extra effort on the part of the animal to increase the size of the nasal cavity which has been partially closed as a result of the disease.

The difficult breathing is more pronounced during the warm months of the year, showing that the disease becomes more aggravated during the hot season and tends to subside or becomes more or less dormant during the cool season of the year.

Description of Gross Lesions

The lesions are confined strictly to the nasal mucous membrane, and rarely extend beyond the first three inches of the anterior nares. The lesions may extend entirely around the nasal cavity including the mucosa of the nasal septum.

In the more acute cases the mucosa becomes markedly congested, which is followed by hemorrhages and sloughing, leaving small denuded areas from which blood, or a mixture of blood and mucous escapes from time to time. In addition to the more acute changes the nasal mucosa becomes thickly studded with numerous, small, grayish, tubercle-like nodules, varying in size, but seldom becoming more than 1/16-inch in diameter in the early stage of the disease.

In cases of long duration there is marked thickening of the nasal mucosa, due to the extensive chronic fibrous changes.

Histopathology

While the histological changes are essentially those characteristic of granulation tissue, the lesions vary somewhat with the stage of the disease. (Figs. 2 and 3.)

In the younger nodules the invading cells are chiefly round, or migratory cells and leucocytes. As the disease progresses, fibro-blasts become more in evidence, and groups or masses of eosinophile cells are seen distributed through the newly-formed fibrous structure. Finally in the chronic stage the entire affected portion of the mucosa may undergo fibrosis.

Certain changes described by Datta,[8] such as perivascular infiltration, endarteritis, degeneration and vacuolization of the mucous glands, have also been noted in some sections examined.

We have not observed very many well-formed giant cells in sections. Neither have we been able to identify definitely as such the "club" formations, or "granules," previously described as having been found by certain other investigators.

In a few of our sections, made from the more acute nodular lesions, we have noted a limited number of small, round bodies, fairly definite in outline, which were evidently not a part of the tissue structure (Figs. 4, 5 and 6). Some of these showed slightly serrated borders, and a number of the bodies appeared to be nucleated. Some were also surrounded by a brownish pigmented circle or capsule (Fig. 6). Small bodies which were thought to be similar in character were also demonstrated in fresh preparations of the nodular material made directly from acute cases at the Iberia Livestock Experiment Station.

Fig. 1.—Photograph of original cow affected with nasal granuloma at the Iberia Livestock Experiment Station. Note the characteristic expansion of the nostril and nasal discharge.

Bacteriological Studies

The original cow affected and also one of the heifers were slaughtered for the purpose of obtaining material for bacteriological and histological studies. Subsequently it was found that plenty of material could be obtained by curretting of the lesions in the more acute cases.

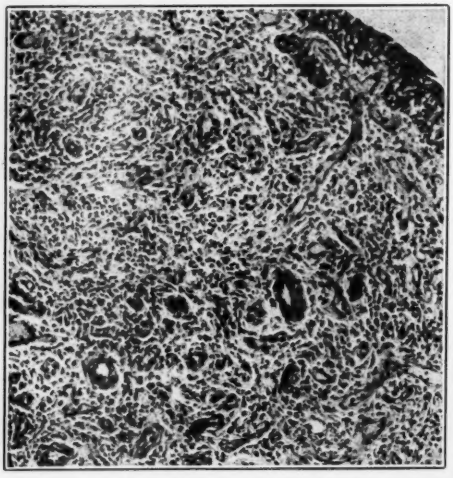


Fig. 2.—Photomicrograph of section from a nasal nodule showing the vascularity of the lesions. Note the numerous small, engorged vessels just beneath the surface of the intact mucosa. x 110.

Microscopical examinations were made of the fresh nodular material and revealed nothing of importance other than the small bodies previously referred to.

Numerous smear preparations were also fixed and stained by different methods, none of which showed acid fast bacteria, or other organisms, which might be incriminated as a possible causative factor.

Cultural Results—Large numbers of cultural inoculations have been made at different times from the nodular lesions. A number of these were made at the experiment station from material taken directly from the living animals, and many have been made from material received at the laboratory. These cultural inoculations have included various kinds of media, for both aerobic and anaerobic organisms. Much of the media inoculated from different lots of material remained sterile. No purely anaerobic organisms were obtained in cultures. Besides ordinary contaminants only a few organisms were encountered which were considered as having possible significance. These included a small, unidentified bacillus, which was isolated at different times, and several fungi. The latter were taken into consideration because of the claims of certain investigators that the disease was caused by a streptothrix.

However, none of these organisms proved pathogenic for either cattle or laboratory animals, and consequently were not given further consideration as having any possible relation to the etiology of the disease, and our bacteriological results were considered entirely negative.

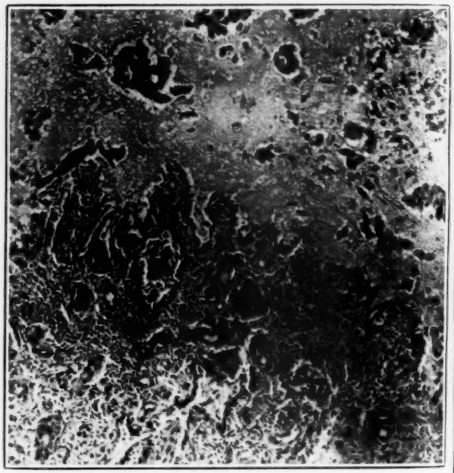


Fig. 3.—Photomicrograph of the nodules showing exudate, necrosis and sloughing of the affected mucosa. x 110.

Animal Inoculations—Inasmuch as all our animal inoculations gave negative results in all cases, it is not considered necessary to give detailed information regarding the same, but to record briefly the methods of inoculation and the kinds of animals used for such inoculations. Our inoculation experiments included both young and mature cattle, and laboratory animals (rabbits and guinea pigs). Most of the bovine

inoculations were made directly into the nasal mucosa, either by scarification or by injections with a fine hypodermic needle. One yearling was used for intracutaneous inoculations. Rabbit and guinea pig inoculations were intraperitoneal and subcutaneous. In order to give ample time for the possible development of lesions in some of the cattle that were inoculated with diseased tissues, five of these animals were held over a period of approximately six months, and two were held for more than a year; none of which showed any indications of nasal lesions.

In the absence of any developments, even of a suspicious nature, in any of the inoculated animals, our inoculation results were considered entirely negative.

Cause of Disease

All efforts made by investigators to date to reproduce the disease in healthy cattle, either by the various methods of inoculation or exposure to affected animals have failed completely. This would seem to indicate that the disease is probably not of bacterial origin. As a further indication that the disease is not of a contagious nature, Datta[6] points to the fact that during all the decades that nasal granuloma has existed in India, it has never been known to assume the form of an epizootic.

On the other hand, both Datta[6] and Malkani[7] present what appears to be ample proof that the disease as it exists in India is the result of parasitic infestation.

Experimental Treatment

Treatment of the affected cattle in the dairy herd at the Iberia Livestock Experiment Station was tried by the administration of potassium iodide internally, local applications of tincture of iodine, argyrol, formalin and sodium bicarbonate solutions, and the intravenous injections of tartar emetic and colloidal carbon. None of these treatments appeared to be of permanent value, although the tartar emetic seemed to give temporary relief. The latter was given in doses of 10 grains in 20cc of distilled water, and repeated every fourth day until 15 injections had been made.

Several of the Indian investigators claim to have obtained more or less favorable results from the tartar emetic treatment but Choudhuri[1] questions the advisability of the use of this drug which, while showing curative properties has certain disadvantages such as the number of injections required, length of time for completing the treatment and intolerance to the drug in certain cases.

Choudhuri suggests another drug, "Antimosan," which he considers preferable to tartar emetic. He describes this drug chemically as consisting of "sodium salt of Antimon-3-Brenz-Catechin-di-sulphonic acid."

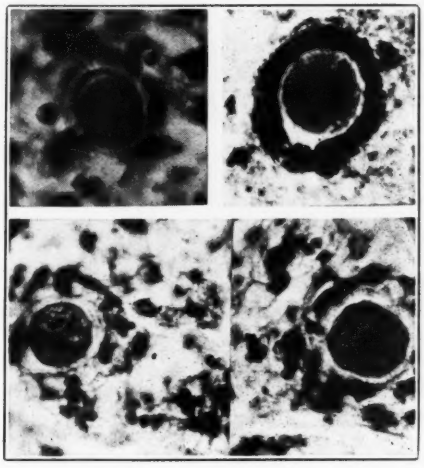


Fig. 4.—Upper left: Photomicrograph showing one of the small bodies, described in the text, highly magnified. These bodies were observed in the more acute lesions. x 800.
Upper right: Photomicrograph showing one of the small bodies, surrounded by a dark, pigmented zone, or capsule, embedded in the necrotic nodular tissue. x 800.
Lower: Photomicrograph showing two of the small bodies in the same field, which differed slightly in size and appearance. x 800.

He reports 12 out of 15 cases cured after two or three injections of Antimosan intravenously. One case (injected subcutaneously) showed no improvement after two injections, and the remaining two cases showed marked improvement after one injection.

Conclusions

We are of the opinion that the disease described herein, and which has not been previously reported in this country, is very similar to, if not identical with, the disease designated as nasal granuloma, which has long been known to exist in India.

We believe that the slow progress of the disease in the herd, the complete lack of evidence that it spreads from animal to animal, and the failure of all efforts to transmit the disease indicate that the causative agent is not of a bacterial nature.

The similarity of the symptoms and lesions of the disease in this country to those of nasal granuloma of India, the similar difficulties encountered in transmitting the disease to healthy animals, and the fact that at least two investigators have recently presented what appears to be ample proof that the disease in India is due to parasitic infestation lead us to suspect that the disease which we have described as existing in this country may prove to be of parasitic origin.

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INSECT CARRIER OF EQUINE ENCEPHALOMYELITIS

Proof that the yellow fever mosquito, *Aedes aegypti,* can transmit a serious epidemic disease of horses and mules, popularly known as Kansas-Nebraska horse plague, has been obtained by Major Raymond A. Kelser, author of the *Manual of Veterinary Bacteriology.* Major Kelser obtained the proof when a horse, on which infected mosquitoes had been feeding, developed symptoms of the disease and became seriously ill. A short time ago Major Kelser reported that the yellow fever mosquitoes had spread the disease among guinea-pigs, which implicated them as possible carriers of the disease among larger animals. At that time, however, the horse on which he had fed the infected mosquitoes had not yet developed the disease. Major Kelser's investigations also showed that the mosquito is not a mechanical carrier of the disease, but that the virus of the disease undergoes a change in the mosquito's body.—*Kalends.*

MADE-TO-ORDER VITAMINS

Synthetic vitamins manufactured by organic chemists from cheap and plentiful raw materials are predicted by G. O. Curme, Jr., winner of the 1933 Chandler medal for researches in chemistry.

Vitamins A, B, and C have been found to be closely related to substances of complex molecular structure, so that synthesis "seems entirely possible," he explained. In the case of other vitamins less is known although it would be surprising from the information now available if they were beyond the range of synthetic chemistry. He predicted that adequate supplies of vitamins will soon be available from relatively cheap and abundant sources and that under the guidance of physiological chemists and dietary experts synthetic chemistry will be able to add another triumph to its many past successes.

Doctor Curme directs the research of the Carbide and Chemicals Corporation.

Azamine in the Infectious Diseases

Azamine is a powerful antiseptic and possesses the ability to penetrate deeply into living mucous membrane, inhibiting the growth of pathogenic organisms at the seat of many infections, thus immediately ameliorating the condition and leading to prompt recovery. Its value in intestinal, nasal and bladder infections is undoubted.

By CHARLES HOEFLE,
Mount Vernon, New York

THE striking success of Azamine in experiments reported by Dr. J. N. Frost of the New York State Veterinary College of Ithaca led me to try out its efficacy in my own field practice among small and large animals.

Coccidiosis is difficult to diagnose, and even more difficult to treat effectively. Many cases that appear to be simple gastroenteritis are found, on microscopic examination, to be associated with, if not caused by, the specific parasites of coccidiosis.

Coccidia are parasites of epithelial cells, although some forms develop in sub-epithelial tissues. In dogs and cats they are found in the intestines in the form of *Isospora bigemina, Isospora rivolta, or Isospora felis.* In the rabbit, two species are seen: the *Eimeria stiedae,* developed only in the bile ducts, and *Eimeria perforans,* only in the mucosa of the small intestine.

These organisms attack the epithelial lining of the lower bowel, denuding large patches, so that hemorrhage is often profuse. The characteristic "red diarrhea" of coccidiosis gradually increases, the proportion of blood and mucous becoming constantly greater, until there is an almost continuous black, fetid discharge from the rectum.

The animal eats well, and vomiting immediately after eating is a common symptom. Although he grows weak and thin, there is no rise in temperature unless some secondary infection sets in. The diarrhea may cease, only to recur in about a week with greater severity. This recurrence appears to coincide with the life cycle of the coccidium. Unless checked, the disease progresses steadily to a fatal termination.

Definite diagnosis of coccidiosis is made by finding oocysts in the feces. If the clinical evidence is not confirmed by the discovery of oocysts in the feces, the mucous surface of the rectum should be scraped with a blunt instrument for a short distance above the anus, and a microscopic examination made of the scrapings. The oocysts generally appear as an oval body containing a central granular mass surrounded by a highly refractile zone with a double contoured body, and is occasionally stained yellow with bile. The average diameter is 12 to 15 microns.

The organisms generally become embedded in the deep intestinal glands; hence, the difficulty of complete elimination and the almost certain danger of recurrence. Even when symptoms are temporarily suspended, the animal is capable of spreading the infection as a "carrier." The problem, then, is to find a means of thoroughly extirpating every oocyst from the body.

It was in the hope of finding such a means that I undertook my experiments with Azamine, using it first in cases that showed oocysts in the feces. My results amply confirmed the findings of the New York State Veterinary College. The Azamine treatment caused a prompt disappearance of the oocysts, checked the

diarrhea, and brought about a distinct systemic improvement in the animal, as shown in the accompanying case histories. There were no toxic effects, no irritation, and the Azamine was quickly eliminated through the urinary and digestive tracts with no apparant cumulative action.

cases for periods extending from two to eight months, and leads to the conclusion that the coccidia have been completely eradicated.

In the fifteen cases here reported Azamine was the only treatment used. The disease was permanently cured in every instance save one, and that one was beyond help when it came into my hands.

TABLE I

Animal	Age	Duration when Admitted	Temperature when First Seen	Miscroscopic Findings	Dose of Azamine	Period of Medication	Out Come	Remarks
Ger. Shepherd	Aged	22 days	Normal	Coccidia oocysts in feces	1 Grain 4 times daily	10 days	Recovered	No recurrence at last report 8 months later
Pomeranian	5 mo.	13 days	Normal	Coccidia oocysts in feces	⅔ grain 3 times daily	10 days	Recovered	No recurrence to date
Persian Kitten	3 mo.	10 days	Normal	Coccidia oocysts in feces	⅓ grain 3 times daily	7 days	Recovered	No recurrence to date
Boston Terrier	9 wks.	15 days	Subnormal	Coccidia oocysts in feces	⅔ grain 3 times daily	9 days	Recovered	No recurrence to date
Cat	8 mo.	4 wks.	Subnormal	Coccidia oocysts in feces	¼ grain 4 times daily	12 days	Recovered	Complete recovery, but killed 2 mo. later
Spitz	2 yrs.	18 days	Subnormal	Coccidia oocysts in feces	1 grain 3 times daily	8 days	Recovered	Diarrhea 8 mo. later, no Coccidia present
English Setter	8 mo.	Irregular*	Normal	Coccidia oocysts in feces	1 grain 4 times daily	14 days	Recovered	No recurrence to date
Collie	Aged	19 days	Normal	Coccidia oocysts in feces	1 grain 4 times daily	6 days	Recovered	No recurrence to date
Rabbit	4 yrs.	15 days	Normal	Coccidia oocysts in feces	⅓ grain 4 times daily	10 days	Died	Badly emaciated, with distinct toxic symptoms
Rabbit	1½ yrs.	20 days	Normal	Coccidia oocysts in feces	⅓ g. t. i. d. for 6 days, skip 3 days and daily for 4 days	9 days	Recovered	The diarrhea ceased after 6 days; recurred 3 days later. Azamine repeated; No recurrence to date
Mongrel Dog	3 mo.	12 days	Subnormal	Coccidia oocysts in feces	⅔ grain 3 times daily	8 days	Recovered	No recurrence to date
Mongrel Dog	2½ mo.	10 days	Normal	Coccidia oocysts in feces	⅔ grain 3 times daily	6 days	Recovered	No recurrence to date
Sealyham Terrier	1½ mo.	23 days	Normal	Coccidia oocysts in feces	⅔ grain 2 times daily	9 days	Recovered	No recurrence to date
Mongrel Dog	2 mo.	4 wks.	Subnormal	Coccidia oocysts in feces	1 grain 3 times daily	10 days	Recovered	Improving; still thin. No coccidia in feces.
Boston Terrier	1 mo.	12 days	Normal	Coccidia oocysts in feces	1 grain 4 times daily	12 days	Recovered	Remained thin for 2 mo. In good condition now

*Attacks of 3 or 4 days duration occurred every two months.

The highly penetrative quality of Azamine enables it to permeate tissue layers and reach the more deeply seated parasites, also to pass readily through the shell-like covering of the oocysts, resulting in its lethal action upon the protozoon being rapid.

This far-reaching diffusive action of Azamine accounts for the fact that no recurrence has taken place in my series of

Azamine has given such gratifying results and is so free from undesirable reactions that I am using it now exclusively in all cases of coccidiosis. The uniformity of the effects of Azamine make it safe to predict recovery in practically every case that has not gone beyond medical aid, or is not complicated by other diseases.

Due to its strongly bactericidal action, I tested Azamine also in cases of urethritis and cystitis, some of which had stubbornly resisted other methods of treatment. The results, as shown in Table II, were highly encouraging, although fewer cases were observed in this series. I was much impressed by the promptness with which these conditions cleared up, even when they progressed to a uremia. I found that flushing the bladder with a ½ of 1% aqueous solution of Azamine hastened recovery, and in one case where cystotomy was necessary two ⅓ grain capsules were left to disintegrate in the bladder without causing any irritation or toxicity.

These experiments led me to believe that a more extensive use of Azamine in other infectious conditions would prove advantageous.

Miscellaneous Cases

Equine Influenza—1. A black saddle mare, 10 years old. Temperature 104° F., pulse 80, chills. Conjunctiva reddened, nasal mucosa congested, copious serous nasal discharge. Rough, dry cough and pronounced rales over chest. Signs of fatigue, pronounced anorexia. Submaxillary lymph glands were enlarged and tender.

TABLE II

Animal	Age	Diagnosis	Previous Treatment if any	Dose of Azamine	Period of Medication	Out Come	Remarks
Pure Bred Male Cat	1 yr.	Urethritis	None	⅓ grain 3 times daily	8 days	Recovery	This infection has not recurred
Male Cat	Aged	Uremic Poisoning Urethral Calculi; Cystitis	;Hexame thylenamine 5 t.i.d.	⅓ grain 3 times daily	13 days	Recovery	Bladder was flushed twice at 2 day intervals with 0.5% Azamine sol.
Male Cat	6 mo.	Cystitis; due to Metastasis following Castration	Hexame thylenamine 5 gr. daily catheterization and hot pads for 10 days	⅓ gr. t.i.d. for 4 days, skip 2 and repeat for 6 days	12 days	Temporary Recovery	Cystitis recurred 1 week later; animal died in another hospital 10 days later
Female cat	About 2 yrs.	Cystitis	None	⅓ grain 3 times daily	4 days	Recovery	Received two daily bladder irrigations 0.5% aq. sol. Azamine
Male Cat	1 yr.	Cystitis; Urethral Calculus; Uremic Poisoning	Hexame thylenamine, 5 gr. t.i.d. and catheterized once. Severe recurrence in a week	⅓ grain 3 times daily	14 days	Recovery	Catheterization impossible at first, due to calculus. After 2 days, catheterized and bladder irrigated with 0.5% aq. sol. Azamine daily.
Male Cat	1 yr.	Cystitis and Urethral Calculus	None	⅓ grain 3 times daily	4 days	Recovery	No recurrence to date
Male Cat	2 yrs.	Cystitis and Urethral Calculus	Hexame thylenamine 5 gr. t.i.d. for several days	⅓ grain 3 times daily	7 days	Recovery	No recurrence to date
Male Cat	2 yrs.	Cystitis with Calculi Severe Uremic Poisoning	None	⅓ grain 3 times daily	3 days	Died	Azimine bladder irrigation twice daily for 3 days — no response.
Male Cat	3 yrs.	Cystitis with Calculi	None	⅓ grain 3 times daily	8 days	Recovery	No recurrence to date
Male Cat	1 yr.	Cystitis, Calculus and Mild Uremic Poisoning	Had not passed urine for 2 days as far as known	⅓ grain 3 times daily	10 days	Recovery	Extremely severe* Cystitis and Uremia.

*This was the most severe case of Cystitis I have ever seen. It was necessary to do a cystotomy and drain as catherization was impossible. Two ⅓ gr. capsules of Azamine were left in the bladder to disintegrate. Seven daily flushings of the bladder with 0.5 per cent aqueous solution of Azamine were given.

The animal was isolated, steamed with ½ oz. of guiacol in a gallon of hot water and given 300cc aqueous solution of Azamine intravenously. Soft diet and daily steaming were prescribed.

Complete recovery in only three days with no other medication.

2. Black Gelding. Temperature 103.6° F.,

pulse 94, chills. Harsh, dry cough, moist rales. Lymphatics about head and neck swollen, mucosa congested. The animal was very depressed and refused food and water.

Aqueous solution of Azamine was given intravenously, and a carminative orally. Some improvement the following day, but temperature rose again on the third day. A second intravenous injection of 300cc Azamine solution was given and a tonic of arsenic and strychnine prescribed for daily use, with soft diet. Recovery was complete in about a week.

Periodic Ophthalmia (Equine)—It had been my practice to use neoarsphenamine intravenously and atropine locally for this condition, with fairly good results. Since, periodic ophthalmia may be a blood-borne infection, I was interested in determining whether Azamine treatment would prove effective here. I used 300cc Azamine solution intravenously and continued the atropine for local application in one case, and at the same time treated another case with neoarsphenamine intravenously and atropine locally. The one treated with Azamine cleared up in about two-thirds of the time required for the other. In seven cases I have treated with the Azamine-Atropine method, there has been complete recovery in one to four days less time than by other methods.

I had also found that neoarsphenamine and other similar preparations were often injurious when left in the tissues outside the vein injected, but the Azamine appeared to be absorbed with full therapeutic effect, and no local abscess formation, necrosis or other undesirable sequellae. This fact has strongly influenced me in selecting Azamine for all diseases that can be treated intravenously.

Surgical Conditions

Phlegmon—In cases of acute suppuration of connective tissues in horses and dogs, I have injected aqueous solutions of Azamine intravenously, 300cc for the horse and 30-40cc for the dog, repeated on the third day. This was supplemented by a daily dressing of the wound with a ½% glycerol solution of Azamine. The lesions healed with surprising promptness, in most cases responding to the local treatment.

Furunculosis—In the past eight months, I have seen considerable furunculosis in dogs, some of which started with the infection of a single hair follicle, developed into larger areas, and finally caused necrosis of the follicles. I injected Azamine solution intravenously, supplementing it with Azamine ointment 10% locally, and obtained complete recovery after a few applications.

Cesarean Operation—Bitches brought to me for Cesarean operation often exhibit a heavy infection of the uterus due to long labor and manipulation of the birth canal by the attendant. This infection has frequently become so extensive and deep-seated that it cannot always be removed sufficiently to prevent serious secondary results. I tried placing a 1/3 grain capsule of Azamine intact in each horn of the opened uterus and allowing it to disintegrate after suturing the organ. The types of cases which had previously died from extensive uterine infection and resultant peritonitis made a splendid recovery after instituting this method. It is now my practice to leave two or three 1/3 grain capsules of Azamine in each horn before closure of the incision.

Gastro-Intestinal Toxemia—I have treated 30 cases of this condition with intraperitoneal injections of Azamine in aqueous solution. The dose is 1cc per pound of body weight daily, and usually only two or three doses are necessary. When first seen, these cases showed a generally dull appearance, staring expression and rough listless skin, no appetite or vomiting but may, or may not desire water, and usually constipation is present. In conjunction with the Azamine injections, I gave an egg and milk diet and a saline laxative. Recovery has been obtained in a satisfactory number of cases. Apparently, there is a heavy bacterial invasion here, of moderate virulence, which is promptly checked by the use of Azamine.

My success with this treatment has prompted me to publish this paper, in the hope that the review of my experience will be helpful to other veterinarians who are facing similar problems.

It is my belief that these results were obtainable because of the unusual physiological properties of Azamine—its penetrating powers and rapid bactericidal action. I was impressed with its rapid elimination in the urine with a complete absence of toxic or irritating symptoms.

CORPUS LUTEUM OF PREGNANCY

The function of the corpus luteum, which is partly understood, may be still further explained by certain recent findings which appear to be of unusual interest. Evidence seems to be accumulating that the corpus luteum is not necessary (as was formerly believed) for the maintenance of pregnancy after the first few weeks. It has been the experience of a number of good gynecologists that the corpus luteum or the ovary which contains it may be removed without the interruption of an existing pregnancy. It does appear, however, that the corpus luteum is essential for the implantation of the fertilized ovum, and there is good reason to believe that the corpus luteum influence is required during the first few weeks of pregnancy. It is suggested that later in pregnancy the control of the attachment of the ovum may possibly be shared by the placenta.—*Therapeutic Notes.*

Practice Pointers

By E. T. BAKER, Moscow, Idaho

WE HAVE found one part metaphen to three parts glycerin the best treatment for canker of the ear. A two-dram vial of this solution is usually sufficient. Cleanse the ear well with cotton soaked in peroxide of hydrogen; allow to dry, then apply three to five drops of the metaphen-glycerin solution, slightly warmed, with an eye dropper or swab. Repeat once daily for a week. This is a good treatment for cases of obscure "itch" in all kinds of animals.

FOR "scum" on the eyes, due to injuries, oat hulls or other foreign objects, we like to dust a crushed quinine and urea tablet into the conjunctival sac. This seems to lessen irritation and congestion. Then, give the owner a dram vial of powdered calomel and small camel's hair brush, and direct him to apply to the eye once daily. If a toughtened area persists over the cornea, try subiodide of bismuth used in a similar fashion.

WE have not performed the radical operation on a fistula or poll-evil for some years. We merely provide drainage, and insert a small capsule containing copper sulphate and charcoal. We sometimes add also some chloral. Then, administer a mixed bacterin, and feed, twice daily, a good powder containing plenty of arsenic, calcium and iodine. Bone meal makes a good base, and sugar or saccharin should be added. We have cured over a dozen cases during the past year with this procedure. In one very bad case, with pronounced anemia, we gave an intravenous injection of two ounces calcium gluconate in 1000cc of water. Within a week, a change for the better was noted by the owner, and in two months, the animal was back at work.

FOR obstetrical cases, proper clothing and equipment, with a few brains and a fairly strong arm, will accomplish more than months of study and memorizing textbooks. The owner wants to know two things: "How's it comin', Doc?" and "Will she git over it?" What the veterinarian is after is successful results.

Some weeks ago we were called to see a Jersey with dystocia. It was two o'clock in the morning, with the thermometer on our front porch registering just six below zero. About four inches of freshly fallen snow was on the ground, but fortunately, the call was to a ranch on a good highway.

We have an old, sleeveless flannel shirt and a pair of ancient trousers hanging up in a back room for just such a purpose. Over this we slipped oiled pants and a sweater, also of the vintage of 1913. Over our shoes we slip high tops, and a warm cap completes our *en semble*. We keep our emergency grip in the kitchen, but the balance of our equipment remains in the car.

We soon arrived at the scene of action, and had the owner bring out a bucket of warm water in the aluminum bucket we carry. First of all, before stripping down for action, we administered a stimulant drench to the cow, and gave her a hypo of sterile camphorated oil. Then we arranged our equipment, such as attaching the wire stretcher to a post, and placed our obstetrical chains in the bucket of warm water with some aseptogen. We had the owner throw in plenty of bedding, and get several gunny sacks. All this was done while warmly clad.

We then removed the sweater and cap; applied lubricating and aromatic oil to our arms, and made an examination. We found the head of the fetus turned back, and also only one foot in the pelvic out-

let. We gave the cow a few gentle kicks and got her to rise. Just 42% of actual labor is saved if one can get the cow to stand.

We then got the head in a correct position, and also the other foot, and pulled them out as far as we could, and attached a 30-inch obstetrical chain to each one. Placing a gunny sack around each chain, we had the owner pull on them, while we directed head. Pretty soon, the shoulders hit the outlet and the fetus stuck. Now, here is where fast work and all equipment in place comes handy. Before the calf could suffocate, we had attached the chains to the wire stretcher, and with steady pulling the calf came out alive and thinking it was the coldest winter since the year of the big frost.

We cleaned the mucus out of the calf's nose, and pulled it up so the cow could take care of it. Having given her the medicine, we could leave her alone. When the calf comes alive, we seldom remove the afterbirth, as we think the cows do better without interference. At half past three we had returned home. Not much science was needed, but being prepared saved us a lot of grief. Figure out a routine to suit your conditions, and then keep on improving this technique, and perhaps in fifty or sixty years you will be pretty fair at this line of practice.

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WE like obstetrical work, and while we run across several cases a year that baffle our efforts, we commonly have good results. These have come from talking the subject over with many good practitioners, and learning of their methods and technique.

The position of the cow; the equipment of the veterinarian, and the manner in which the case is handled, means much in this kind of work. When the cow is down and unable to get up, think of milk fever, and treat this condition before tackling the obstetrical part. If an examination reveals a monstrosity, tell your client what you have found, and if you do not think you can get it successfully, destroy the animal, perform an autopsy and you will have a satisfied client. Of course, a reasonable amount of effort should be made.

Allowing the cow to lie on her side, straining against you, is just plain foolishness. Raise the hind legs of the cow, and then you can correct the position of the fetus without much trouble. One can even pull her clear up like a beef in a packing house. Then attach the chains to the fetus and when the cow is lowered, the calf comes. Spreading the legs apart in young heifers sometimes widens the pelvic outlet just wide enough to let one shoulder through at a time. When the fetus is just too large, perform embryotomy without delay. Unless a leg is unusually crooked, we never cut it off, as it is our most valuable ally in giving us an attachment. Our experience has taught us when the fetus has to be cut up, the mother dies in about 90% of the cases. A half-hour spent on a careful examination, and getting the cow in a workable position, is far better than working like a trooper all night, and then giving up at last. We used to do this before Mother Experience developed a few wrinkles on our two-cylinder brain.

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THE county agent who endeavored to play square with the local business business and professional men found the latter ready to help him when the occasion demanded. How about the over zealous agent who vaccinated pigs and calves; who advised people what to do for their own ailments; who purchased supplies from distant mail order houses, and who thought they had to cater, body and soul, to a small group of selfish, tightwad farmers? Most of these short-sighted men are doing something else in order to eat these days. There is a place for county agents, if they will only keep in this zone. They can build up good will and help their clients so that they are a steady fixture.

AND what about the veterinary colleges who absolutely ignored the local practitioner? We know of one veterinarian who had lined up a large number of horses for bot treatment at a price of seventy-five cents per head (cheap enough if the work is done right). He had to travel about fifty miles to make the entire trip, and figured he could just about make mileage on the work. A well-to-do farmer, who still possesses the first nickel he ever earned, drove to his nearest veterinary college and explained the matter to them. They kindly offered to do the work for fifty cents per head. Paying no taxes; receiving their salaries from the public, and purchasing their supplies much the same way, they wonder now why the practitioners are not rushing to their rescue in an effort to keep up their fat appropriations this winter by the state legislature. Samples of this "live and let live spirit," we hear so much about in our association meetings and magazines have been a hollow mockery in my humble experience.

THIS unfortunate condition in veterinary circles has been largely due to several things. In the first place, lack of practical experience on the part of the college or extension veterinarians. They are too anxious to please their clients and overstep the bounds of professional courtesy in doing so. They do this, in many cases, in absolute ignorance of the effect upon the practitioner. In the second place, some men are just natural born trouble makers, and delight in showing off at the expense of the local man. In the third place, where there are too many practitioners in a community, there is always more or less friction, resulting in cut prices, unethical conduct and a general "mess" all around.

It is too bad for the profession at large that more men have not had wider experience. The veterinarian who has had several years in the federal bureau of animal industry, or in a state capacity, together with some college and laboratory experience, is a better practitioner for this training. He sees the other phases of his profession, and he respects their value.

We are all working for the common good. The dean of the veterinary college who respects the rights of the practitioner; state officials who cooperate with their experiment station men; federal employes who attend to their own business and work in harmony with local practitioners, all promote what history calls James Monroe's second administration, "an era of good fellowship."

Until men learn to respect the rights of others and to practice the precepts of the Golden Rule, we will have the present condition to face, irrespective of laws, rules, sermons, association regulations and the like.

OUR practice varies somewhat with the season in which spring opens up, but in a series of twenty years, from 1913 to 1932, inclusive, our best months run in the following order: First, May; second, April; third, October; fourth, August; fifth, July; sixth, June; seventh, March; eighth, December; ninth, September; tenth, November; eleventh, January; twelfth and last, February.

We have a severe climate, divided into two seasons, August and Christmas. Our spring usually begins in April, running to the middle of June. Then summer and harvest continue until September. Autumn sometimes lingers to December, for last fall we had roses on our bushes for Thanksgiving. Winter comes along the first of December and may last until June, as it did two years ago. Our worst month to get around in is usually February, although when winter sets in early, we may have an abundance of weather through January.

The temperature may vary from thirty below to one hundred and three in the shade. We have cycles of hot and dry summers and then several rather cool and wet. One winter we may have nine feet of snow as we did last winter and the

next one only a few inches. As a rule, our most abundant crops follow heavy snows, for then there is plenty of moisture all spring and summer. As one client expressed it: "We have cold weather as long as the snow stays in the mountains, and as long as there is snow in the mountains we are liable to have cold weather."

Weather is an important item to the average practitioner. We have a good barometer and when it begins to slip down, we look for milk fever cases. In the spring, when a storm threatens, we omit castrations. Of course, the radio helps a lot in weather forecasts, for we can sidestep a trip into the mountains to a sheep camp if a severe storm is on the way. Of course, we do not allow the weather to keep us from our work, but we try to use a little judgment.

We think many practitioners do not pay enough attention to their clothing and personal hygiene. Comfortable shoes to a good cap, with plenty of woolen clothes are essential to our physical welfare in this climate. Keeping in good health makes us feel glad we are alive. Life is too short to go around complaining about one's health. People are not interested in your troubles, anyway. We have noticed the chronic invalids who enjoy poor health usually live to be eighty or ninety, and then merely dry up and quit. We have never used tobacco and very little booze. We like eight hours sleep, and we keep our leisure time for ourselves to read, write or amusements such as our small town affords, mostly bowling.

Good management saves much worry. There is a time to do everything in its place. We see this in the good rancher. His crops are put in at the right time. His machinery is in good shape. His livestock are well cared for. His fuel is in the dry. He is never rushed or overwhelmed with his work. The same applies to practice. Keep your work in hand. Clean up your little jobs like testing cows every week, so they will not accumulate. Keep your equipment in first class order. Do not become over ambitious and find yourself land poor. Don't try to run your community and be the Andrew H. Brown of every lodge, club or other organization. We know of some practitioners who are so busy they cannot attend to their own business. They rush hither and thither, finally dying suddenly of the pip and leaving a wife and family to wake up and find there is no estate, no insurance, no nothing, but a flock of anemic statements and a bunch of debts. Why not take things easier? Why not have some spare time to contemplate the intricate phases of life, and what, if any, difference there is between the mummy of the late King Tut and the Republican party!

Another thing we have noticed in our rambling around, and that is many men do not keep their stock of supplies down to a reasonable quantity. Several times a year we gather up all our odds and ends of drugs and bilogics and use them before beginning on new stuff. In this way the overhead will be kept down and a dollar saved in practice is just the same as making it.

As we have said many times before, the gross of a practice is far from the net. Some men can save money on a $3,000 practice, while others go broke on a $7,000 one. If one keeps his bills paid, and pays cash for supplies, it is remarkable how much he can save. With 10% off for cash, one will receive a year's supplies free every ten years. In other words, by keeping on a cash basis, we have had two years' of purchases handed to us as a gift in the past twenty years. Perhaps being 75% Pennsylvania Scotch (not the liquid kind) accounts for some of this "canniness." As the late Benjamin Franklin said: "Take care of thy business, and thy business will take care of thee."

WE receive letters from practitioners all over the world regarding sheep troubles, and the use of calcium gluconate in milk fever. We are struck by the neat letterheads and envelopes of these "furriners," and the fearful and wonderful "writin' paper" used by some of our na-

tive American veterinarians. Some of the latter still persist in using a light green or yellow colored sheet, with their name and address in eighteen point type. In the center or at the side may be a prancing horse, or the head of a cow—in many cases, a bull would be more appropriate.

Do our veterinary colleges instruct their graduates how to conduct a business of practice, and how to choose neat, professional appearing stationery? We fear some of them do not.

Why not use a good grade of bond paper, white, with an envelope to match? A six point Gothic type, or better still, embossed, in deep blue or blue black, makes a fine looking letterhead and envelope. Having such imposing titles as "Deputy State Veterinarian," or "Manager City Dog Pound," in twelve point type, together with any other business address, such as "Sole Proprietor and Owner of Bunk's Service Station," or "District Manager Ptomaine Dog and Cat Food," does not add to the attractiveness of a letterhead.

Place your business on a professional basis. Use the same uniform type for all your stationery, such as letterheads, envelopes, statements, labels, checks and the like. Half-size letterheads and statements, 8½x5½ inches, fold in envelopes very neatly, and one can usually say all that is needful on a sheet of this size. We have a few full sized letterheads, more for social correspondence than for business. Our labels are 2x2 inches, and contain the same simple legend for a simple-minded practitioner, to-wit and thusly:

Dr. E. T. Baker, Veterinarian, Moscow, Idaho

This is in six point Gothic, and serves its purpose just as well as a more ornate creation in Old English or the like. We like to patronize our home printers, for they are neighbors of ours, and make their living in the same community as we do. Having learned the printing trade in our early youth, we know some of their trials and tribulations.

AND have you kept on a cash basis? When the first of March rolled around and we sauntered down the street to find all our banks closed as tight as a millionaire's mausoleum, we were somewhat glad that twenty-five dollars would pay all our bills. For years, we have made it a point to not buy anything we cannot pay for. We have had opportunities to

Treating a Rabbit for Ear Canker.

purchase ranches "dead cheap," at a dollar down and a dollar when they could catch us, but we turned the other ear. We resolved, years ago, to get all the pleasure we could out of life as we went along, and not be overburdened with property, debts, installment payments and the like. We see all around us farmers, who fifteen years ago, owned 160 acres out of debt, with money in the bank. Trying to buy all the land in sight, they are now broke. The average professional man is usually property poor, financially constipated and always dabbling in some company or other. When we are tempted to do this, we read a few pages of Benjamin Franklin's autobiography. We have made financial mistakes, we admit, and we have lost many accounts that we might have collected had we used a little business acumen. However, the get-rich-quick bug has never attacked us so far, and we merely believe in living within our income. Old Mother Experience, however, has taught us all a few lessons, as she always does, the past few months, and it is a waste of time and space to elaborate upon it.

Traumatic Posterior Paralysis In Dogs

By H. J. MAGENS,
Huron, S. Dak.

PROBABLY no other complex of symptoms in veterinary medicine offers as wide a range of diagnostic and prognostic difficulties as that large group described clinically as posterior paresis or paraplegia. This leads me to review some principal aspects of this baffling condition.

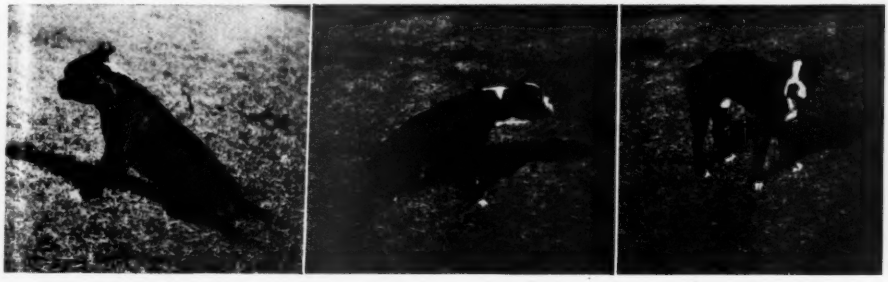
Inasmuch as this heading is in no way meant to convey a definite etiological entity but only a clinical finding it is evident that many pathological conditions may be responsible for it. These conditions may have their seat in the nervous system, the brain, the spinal cord or the peripheral nerves. Diseases of the spinal cord and its coverings are in some instances causative factors for a partial or complete posterior paraplegia. They in turn may be caused by mechanical or traumatic injuries, spinal fractures or fissures, luxations, hemorrhages, edemas, tumors and finally contusions. Myelitis and meningitis of various forms as well as sclerosis of the spinal cord may be present. Important are also primary and metastatic infections. They explain many spinal derangements in all species following certain infectious diseases such as canine distemper, pyemia or perhaps tuberculosis. Jacobs found fibrosarcomata inducing this condition; other authors think their action is mostly through the exerted pressure. Absorption of toxins from poisonous substances or due to helminthiasis and subsequent pathological changes may also cause these phenomena. They may be due to pathological changes in the bony tissues of the lumbar or sacral vertebral structures and also of those of the pelvis, intervertebral and pelvic articulations. Changes in the muscular and fibrous apparatus of the region might have occurred. Finally diseased conditions of vessels such as arteries and veins might have taken place.

IT IS evident that these varied causes will not always present a uniform constant clinical picture, yet it is surprising that in spite of the wide range of causes in very many cases findings are clinically alike or similar. Whenever the paresis is complete the diagnosis is practically not so important since in most cases recovery is out of question. Sudden appearance of the condition in no way signifies that we are dealing with an acute case. A careful anamnesis will eliminate all conditions due to infectious diseases. It will also establish facts concerning traumata or mechanical injuries which have happened to the animal; such as falls, blows, car accidents either by jumping out of a vehicle or being struck or run over, etc., wounds inflicted by firearms, etc. If no specific cause is known the owner will say that the animal either suddenly or gradually lost control over his limbs, finally dragging them in a pitiful manner. In some instances it will manage to stand up although swaying very much. In most cases loss of control over the sphincters of the rectum and bladder are reported. The appetite remains good, general condition fair, mental status alert.

ESSENTIALLY these are also the clinical symptoms shown. Locomotor ataxia, gradually increasing difficulty of standing and walking, later on loss of control over sphincters of the bladder and lower bowel. At first the general condition is little affected; secondary conditions may alter this. It should be borne in mind that two conditions are of the same diagnostic value. First, a paretic appearance of the

hind limbs, a hyperthropy, which due to lack of muscular tonus makes the limbs appear as if anesthetized; secondly a spasmodic condition of the hind limbs, as they appear in cases of strychnine poisoning due to an abnormal increase of tonus. These conditions have been observed in the same subject at different times.

Spinal motor paralysis with complete loss of coordination of muscular effort and movement appears whenever the working power of the spinal cord has been diminished. Tissue tears, compressions, bony fissures will cause this condition. A paraplegia is symmetrical in distribution bilaterally. It is also symptomatic for traumatic interference with the spinal cord and its coverings. The fact that reflexes are intact indicates that the seat of the injury is in the lumbar region or posterior to it. If the injury is located more forward over-



sensibility of reflexes will exist. Muscular atrophy accompanies spinal injuries. It is absent where paralytic conditions emanate from the brain, local nerve control remaining unimpaired. Nerve control of the region involved is concentrated in the ischial, sacral and pubo-coccygeal plexi. Their involvement limits the region of the injured area to the lumbar vertebrae and posterior thereof. Therefore important muscular groups as the gluteal, bladder and lower bowel cease to function properly.

Traumata, fractures, fissures, luxations are in many cases difficult to locate in this region. To be sure where damages are extensive positive findings are certain. Tears, interruptions of continuity of the spinal coverings, internal edema or hemorrhages as available is excellent. One should guard early against the effects of cystitis and hypostatic pneumonia and their consequences. Mechanical evacuation of the bowels by enemata are advisable. Decubitus becomes very annoying in the latter stages of the well as contusions may become evident only upon postmortem examination.

TREATMENT is consequently difficult. Rest and massage of the limbs are principal factors. Electrotherapy where disease and indicates a general breakdown and unfavorable prognosis. The course of these conditions is rather prolonged. Unless a marked change for the better may be observed steadily progressing from day to day the prognosis should be guarded.

Autopsies should clear diagnostic troubles, although even then microscopy will have to be resorted to.

PNEUMONIA PROPHYLAXIS

In the treatment of canine distemper, no matter how slight the attack, I never fail to apply an antiphlogistine jacket, renewing it daily for several days until I am certain that pneumonia has been avoided. Even in cases where pneumonia has developed, I find the application of an antiphlogistine jacket most effective; the dyspnea is reduced, the pain relieved, the absorption of the exudates encouraged.

Besides the efficacy of this measure, I believe that it makes a good impression on the owner, assuring him that everything is being done to bring about recovery of the patient.

W. D. Howatt,

Mamaroneck, New York.

DO YOU REMEMBER?

1. Question. What bacterial diseases of animals are communicable to man?

Answer. (a) The following bacterial diseases, primarily of animals are directly (by contact with affected animals or their discharges) transmissible to man:

(1) Glanders—*B. mallei.*

(2) Bovine tuberculosis—*Mycobacterium tuberculosis.*

(3) Undulant fever—*Br. abortus—Br. melitensis—Br. suis.*

(4) Swine erysipelas — *Erysipelothrix rhusiopathiae.*

(5) Anthrax—*B. anthracis.*

(6) Salmonella infection—*B. enteritidis, B. aertrycke, B. suipestifer* from rodents and domesticated animals.

(7) Tularemia—*B. tularense.*

(8) Melioidosis—*B. whitmori.*

(9) Perhaps Pneumococcus Type III from guinea pigs.

(10) Avian tuberculosis (rarely).

To the foregoing may be added: the Rickettsias—epidemic, endemic and exanthematic typhus (*Rickettsia prowazeki*), and Eastern and Western Rocky Mountain (spotted) fever. Typhus and spotted fever require vectors (ticks, fleas and biting flies) for transmission to man. Various rodents and perhaps other mammals are the natural reservoir of the Rickettsias.

(b) The following additional bacterial diseases are indirectly (through insect vectors, contaminated milk or meat, etc.) contracted by man from animals:

(1) Malignant edema, gas gangrene—*Clostridium welchii* and *Cl. oedematiens* (contamination of wounds with animal feces).

(2) Tetanus—*Clostridium tetani* (contamination of wounds with animal feces).

(3) Botulism — *Clostridium botulinum* (meat containing botulinus—type A and type B—toxins).

(4) Mouse typhoid—*Salmonella typhimurium* (contaminated food).

(5) Paratyphoid—*B. paratyphosus* (contaminated food).

(6) Bubonic plague—*B. pestis* (flea vectors).

2. Q. What fungous diseases are transmissible from animals to man?

A. Perhaps only ringworm—*Trichophyton tonsurans*—and favus—*Achorion schoenleini*—directly.

Indirectly—

(1) Actinomycosis — *Actinomyces bovis* (by unknown agents).

(2) Pneumomycosis—*Aspergillus fumigatus* (by unknown agents).

(3) Sporotrichosis—*Sporotrichum beurmanni* (by unknown agents, possibly directly).

(4) Erythrasma—*Microsporum minutissimum.*

(5) Trychorrhexis — *Trichorrexis nodosa.*

3. Q. What virus and protozoan diseases of animals are communicable to man?

A. (a) Virus diseases:

(1) Foot-and-Mouth disease.

(2) Vaccinia—(Paschen bodies).

(3) Rabies.

(4) Psittacosis.

(5) Equine encephalomyelitis (doubtful).

(6) Infectious anemia of horses.

(7) Dog distemper (experimentally transmissible).

(b) Protozoan diseases:

(1) Coccidiosis—*Eimeria stiedae* (very rarely).

(2) Rat bite fever—*Spriella morsus-muris.*

(3) Kala-azar — *Leishmania donovani* (natural reservoir host not known).

(4) Sleeping sickness — *Trypanosoma gambiense* (indirectly by insect vectors).

(5) Malaria—Genus *Plasmodium* (passes sporogony cycle in mosquitoes).

(6) South American Trypanosomiasis—*Schizotrypanum cruzi* (infection is contaminative through feces of flies).

(7) *Teratoma magista.*

(8) *Balatidium coli* (hog).

(9) Relapsing fever—*Spirocheta obermieri*

(10) Spirochetal jaundice — *Leptospira icterohemorrhagiae.*

(11) Yellow fever.

4. Q. What parasites of animals may pass one stage of their life cycle in man?

Answer.

(1) Flukes—*Fasciola hepatica* (occasionally).

(2) Flukes — *Paragonimus westermani* (rarely).

(3) Trichinosis—*Trichinella spiralis.*

(4) Tapeworm—*Echinococcus granulosus.*

(5) Dog tapeworm — *Dipylidium caninum.*

(6) Pork tapeworm—*Taenia solium.*

(7) Beef tapeworm—*Taenia saginata.*

(8) Fish tapeworm — *Diphyllobothrium latum.*

(9) Tongue worm of dogs—*Linguatula serrata.*

5. Q. What parasites of animals may become temporary parasites of man?

Answer.

(1) Chicken mites.

(2) Sarcoptes of horses, cattle, dogs, cats, hogs, camels.

(3) Notoedrus of cat.

(4) Psoroptes and chorioptes of sheep.

(5) Ticks of dogs.

(6) Simulium flies—Buffalo gnats.

(7) Various flies—their eggs and larvae (*Dermatobia cyaniventris, Cordylobia anthrophaga*).

6. Q. What diseases of man are commonly milk borne?

A. (a) Diseases of animals transmitted through their milk:

(1) Anthrax—*B. anthracis.*

(2) Foot-and-mouth disease — *Aphthomonas infestans* (rarely, perhaps because of veterinary police measures).

(3) Undulant (Malta) fever—*Br. melitensis. Br. abortus and Br. suis.*

(4) Scarletina—*Streptococcus scarletinae.*

(5) Tuberculosis—*B. tuberculosis bovis.*

(6) Gastroenteritis—*B. enteritidis.*

(7) Poxes—*Cytorrhyctes vaccinae,* etc., (possibly).

(8) Milk sickness—due to trematol, a poisonous chemical in the milk of animals suffering from "trembles" (white snake root poisoning).

(b) Diseases transmitted by milk which is accidentally contaminated with pathogenic organisms from human excretions:

(1) Cholera—*Spirillium cholerae.*

(2) Typhoid—*B. typhosus.*

(3) Paratyphoid—*B. paratyphosus.*

(4) Poliomyelitis—(?).

(5) Diphtheria—*B. diptheriae.*

(6) Dysentery—Bacilli of colon-typhoid group.

(7) Hemolytic (septic) sore throat—*Strep. epidemicus.*

The author gratefully acknowledges assistance of Drs. U. C. Houck and Karl F. Meyer in preparing the foregoing.

Wesley O. Keefer,
Ramsay, Montana.

ONLY FOUR CAUSES OF DISEASE

That medical science knows only six separate causes of illness, with a distinct possibility that there are only four, was asserted to the Guild of Pharmacists, in London, by Dr. Wilfred Trotter of University College Hospital.

"One is injury, such as backache from a sprain, or ill health as a result of a wound.

"A second is malformation of some part of the body, such as a hunchback or some other deformity at birth.

"Third is a defect of diet, causing scurvy, rickets, or one of the other diseases now known to be caused by lack of vitamins.

"Fourth is poisoning, including accidental poisonings, such as lead-poisoning from impure water, or the slow poisoning believed by some experts to be caused by automobile fumes.

"Fifth is infection by parasites, including the large number of diseases caused by germs.

"Sixth and last are what physicians call 'neoplasms,' including cancer, and other malignant growths.

"Dr. Trotter believes, indeed, that only four of these causes of illness are indubitably real: namely, injury, bad diet, poisoning, and parasites. Of the other two, malformations and deformities may be due to injuries, germ infections, or bad diet before birth, while it is probable that the cause of cancer will be discovered some day in some germ or diet difficulty."—*Lit. Digest.*

LACK OF SANITATION SPREADS SWINE DISEASES

According to reports from practitioners in various sections of the country, diseases of swine including cholera, are apparently more prevalent than usual at this season of the year.

The excess occurrence of swine disease is no doubt in part due to the fact that for the past several months the price of hogs has not been conducive to the necessary expense for veterinary service and coupled with this is the fact that most farmers have not had the funds to pay for treating their sick and afflicted animals.

Again community sales have been and are being held regularly in numerous places in the central west. Hundreds of swine pass through these sales and in many of them there are no requirements for either health certificates or vaccination. Thus, swine are sold regardless of their condition and transported in many instances interstate without any restriction and yet practically every state has laws prohibiting such activities.

The writer recently investigated a herd of diseased swine in an adjoining state. The owner had purchased over 100 feeders at a community sale and transported them to his farm and placed them in a lot with some sixty hogs, the most of which had not been vaccinated. The results were not unusual, the community sales shotes sickened and within a few days losses occurred in the native hogs. The final outcome will be the loss of two-thirds of all the swine on the premises.

The livestock sanitary commissioner in another state recently stated that his field force spent the major portion of their time in looking after diseased hogs and the source of the trouble in the most instances was community hog sales.

Another prolific method of disseminating infection is the so-called hog clinics conducted by county agents and salesmen for lay-serum companies. The unrestricted distribution and use of virus will suffice to keep an abundance of the cholera fires burning and thus insure a constance source of infection.

It is unfortunate that cholera control measures other than vaccinations are not rigidly enforced. The unrestricted distribution and use of virus is probably the most important factor in establishing new centers of cholera and in maintaining infection. Just as long as present conditions are permitted to exist there will be an abundance of cholera and therefore necessity for practitioners to render a service by proper vaccination.

Various other swine ailments are apparently more prevalent than usual this season, therefore greater care should be exercised in determining the exact physical condition of all herds prior to vaccination.

VETERINARY MEDICINE will be pleased to receive comments on and discussion of present hog cholera control measures.

A. T. Kinsley,

Kansas City, Mo.

OBSERVATIONS ON CANINE WHIPWORM ERADICATION

Valuable information concerning canine whipworm eradication has been gained by experiments conducted by Paul C. Underwood, Willard W. Wright and John Bozicevich, Zoological Division, Bureau of Animal Industry, United States Department of Agriculture.

They have shown that a single rectal injection of an anthelmintic cannot be depended upon to reach all parts of the cecum. They have also shown that under certain conditions it is possible for a drug to be injected *via* rectum and fill the cecum. This they proved by the use of mercurochrome. Little doubt was expressed by them that a direct injection of the anthelmintic into the cecum would give the desired results.

They, however, conclude that the intracecal method of treating dogs for whipworm is of little or no value. This conclusion is, no doubt, based on the experiments they described in the report, which were single injection tests.

Since making my first report on this subject in 1930, my experience has corroborated such findings. In some cases

many treatments are necessary before fecal examinations reveal no ova of this parasite, nevertheless if intracecal injections of a suitable anthelmintic are persisted in, they succeed.

Recently, an injection of 1½ drams of oil of chenopodium in an ounce of paraffin oil failed to remove the whipworms from a 16-pound dog. The requirement is certainty that the anthelmintic reaches all parts of the cecum. Repeated daily doses may and frequently are necessary in order to strike a time when the orifice to the cecum will permit the drug to enter the cecum and when that viscus is not filled with ingesta. Furthermore, when fecal examinations prove negative on a single examination, it is not positive proof that all the worms have been killed.

It seems reasonable that an animal, the stools of which consistently show eggs before treatment and then after treatment prove consistently negative under the microscope for weeks and months, has been freed of the parasites. This result I was unable to obtain with santonin in repeated doses giving many long courses of treatment over a period of six or eight years with my own dog. The tolerance of the colon for oil of chenopodium is much greater than is the tolerance of the stomach and small intestines for this agent. This is true for most substances, the toxic effect of which depend on absorption.

Another very important advantage of treating trichuriasis *via* rectum is that of proximity as we are able to introduce the agent near if not directly to the seat of infestation. In my experience, which is considerable, there is no case of trichuriasis in the dob but will respond to *repeated* injections of oil of chenopodium *via* the rectum made in the manner described in my former article. In house pets I have found the problem of preventing reinfestation a minor one; in kennels reinfestation in some cases is probably unavoidable.

However, since our conclusions are based entirely on microscopic fecal examination, the testimony of the practitioner is in no way infallible. We must be guided by the critical tests in laboratory in our clinical procedure.

F. G. Steinbach.

Wildwood Crest, New Jersey.

TUBERCULOSIS FROM COWS

Again comes the confirmation that anti-tuberculosis work among cattle is of great value in preventing the disease among humans. During a period of three and one-half years, January, 1929, to October, 1932, specimens of pus were taken from 81 patients suffering from tuberculosis of the bone or joint and under treatment at the St. Andrews Home on the Isle of Cumbrae, Firth of Clyde. Examination of the specimens disclosed that the bovine tubercle bacilli caused the difficulty in 27 or 33 per cent of the cases.

Statistics of the experience in Illinois show that tuberculosis of the bone and joints and of the abdomen in children, the types most frequently caused by bovine tubercle, has declined markedly since the campaign against tuberculosis among cattle.—*Illinois Health Messenger.*

HAY FEVER

Hay is not a cause; fever not a symptom of hay fever. It occurs in three distinct waves each season; one in the spring, due to tree pollen, a longer and more severe wave in early summer due to grass pollen; and the longest and severest in late summer due to weed pollen. Of the trees, willow, birch and elm are the worst offenders; of the grasses, blue grass, orchard grass, timothy and red top; and of the weeds, the ragwood are chiefly responsible.

Some people are susceptible to only one pollen; some to two or more pollens; and some to dandruff, feathers, etc.; and some only to a combination of dandruff or other animal protein and pollen.

Hay fever is an allergic ailment as is also asthma, hives, or urticaria, canker sores, some types of headache and anaphalaxis or serum shock. There is some evidence that periodic ophthalmia and perhaps even purpura hemorrhagica belong to this group of diseases.

Mather Tower—75 East Wacker Drive, Chicago. The office of Veterinary Medicine is in this building. The observatory is 549 feet above street level and is one of the finest view points in the city from which to see Chicago. The headquarters for the A. V. M. A. meeting in August is but five blocks away.

THE CHICAGO A. V. M. A. MEETING

Plans for one of the best and perhaps the most largely attended A. V. M. A. meeting in the history of the Association are rapidly taking shape. The program is as yet far from complete, but papers on the following subjects have been promised and accepted:

Sterility in Cattle—W. L. Boyd, St. Paul, Minn.
Surgery in Horses—Wm. J. Lee, Philadelphia.
Large-Animal Practice in the South—Hamlet Moore, New Orleans, La.
Hog Cholera—C. H. Stange, Ames, Iowa.
A Century of Hog Cholera—A. T. Kinsley, Kansas City, Mo.
Common Diseases of Sheep—F. E. Stiles, Battle Creek, Mich.
Gas Edema—C. J. Marshall, Philadelphia, Pa.
Hemorrhagic Septicemia—A. F. Schalk, Columbus, Ohio.
Some Observations on Ailments and Treatments of Inmates in Zoological Collections—J. A. Campbell, Toronto, Ont.
Practical Anatomical and Physiological Considerations of the Dog—E. J. Frick and W. M. McLeod, Manhattan, Kans.
The Schilling Blood Picture in the Diagnosis of Canine Distemper—M. L. Morris, New Brunswick, N. J.
Blood Chemistry Findings and Their Interpretations in Diseases of Animals—J. L. Bollman and C. F. Schlotthauer, Rochester, Minn.
Allergic Reactions in Dogs—P. W. Burns, College Station, Texas.
Nicotine Sulphate as a Vermifuge for the Removal of Ascarids from Poultry—Wm. S. Bleecker, Fayetteville, Ark.
Some Studies on Infectious Laryngotracheitis of Fowls—C. A. Brandly, Manhattan, Kans.
Studies on Fowl-Pox Vaccination—E. S. Burnett, Ithaca, N. Y.
Poultry and the Practitioner—Norman W. Ackerman, Van Horne, Iowa.
Infectious Enterohepatitis of Turkeys—L. H. Schwarte, Ames, Iowa.
Some Problems in Poultry Nutrition—H. L. Wilcke, Ames, Iowa.
Familial Incident of Lymphocytoma in Three Generations of the Domestic Fowl—R. Fenstermacher, St. Paul, Minn.
Preliminary Report on Trichomoniasis in Pigeons—E. F. Walker, St. Paul, Minn.
The Morphology, Culture, Isolation and Immunity Studies of Actinomyces Necrophorus in Calf Diphtheria—L. H. Scrivner and A. M. Lee, Laramie, Wyo.
Studies on Canine Distemper: IV. Immunization of Dogs by Means of Bacterial Products—A. S. Schlingman, Detroit, Mich.
The Cultivation and Egg Transmission of the Avian Tubercle Bacillus—H. J. Stafseth, East Lansing, Mich.
The Susceptibility of Brucella Abortus and Salmonella Pullorum to Disinfectants—Ernest C. McCulloch, Madison, Wis.
Studies on Rabies Vaccination—M. F. Barnes, Harrisburg, Pa.
Report on the Examination of the Blood and Urine of Colts—W. W. Dimock, Lexington, Ky.